

**PROCEEDINGS OF THE AMERICAN FOUNDRYMEN'S
ASSOCIATION, IN CONVENTION AT BOSTON,
MASS., JUNE 17, 18 AND 19, 1902.**

Through the courtesy of the authorities of the Massachusetts Institute of Technology, the seventh convention of our Association was held in Huntington Hall. The opening meeting was called to order by the Secretary at 10 A. M. Tuesday, the 17th of June, 1902.

The Secretary: Ladies and gentlemen, members of the American Foundrymen's Association: It is my painful duty to call the meeting to order, because, as you know, of the sad and tragic death of our President, Mr. Sadlier. Our acting president, the senior vice president, Mr. Colvin of the New England States, has preferred not to take the Chair, because he feels that some one other than from New England should do so at this meeting, and therefore I will call upon Mr. Walter F. Prince, the Vice President for New York and New Jersey, to do so.

Vice President Prince. Gentlemen of the American Foundrymen's Association: It is very sad that the Chair cannot be filled by our President, but, if agreeable to you all and in accordance with the constitution, I will endeavor to do the best I can. Our Secretary has stated that our first vice president thought it better to have some one from out of the district preside. I thought this was a chance for me to keep in the background, as, if anybody has a claim on Boston I think it is myself. I was born, brought up, and started in the foundry business here, and think that this would entitle me to freedom from the cares of a presiding officer here. I will however do the best I can. The meeting will now come to order, and I beg to present to you Mr. H. A. Carpenter, the president of the New England Foundrymen.

Address of MR. HENRY A. CARPENTER.

Mr. President, Ladies and Gentlemen, Members of the American Foundrymen's Association:

I have been requested, perhaps on account of my connection with the New England Foundrymen's Association, being

its President, to extend just a few words of welcome to you, and to try and endeavor to make you feel at home. It is my privilege also to be the President of the New England Foundrymen's Entertainment Association, an organization that was recently formed for the purpose of providing entertainment for this assembly. The results of our undertakings you cannot tell until Friday morning, perhaps, and then if pleasant memories fail to exist in your minds, and if they fail to continue to exist, we will feel that we have not succeeded in what we have attempted to do. We ask your co-operation in and prompt attendance at the various forms of entertainment which we have provided and which are outlined in the programmes that you have already received. It is necessary for you to signify your acceptance of the various entertainments as provided at a very early date to enable the Committee to make the proper arrangements.

And now, on behalf of the New England Foundrymen and of those connected with the allied interests, I want to extend to you, one and all, a hearty welcome. Let me assure you that we thoroughly appreciate your coming, and that the pleasure we have anticipated in making the arrangements and carrying out the features of the programme will be greatly enhanced if we can succeed in interesting you. The value of this convention depends wholly upon the individual. We must admit that our trade is the least developed, or among the least, of any of the trades at the present day; but assemblages of this character, where earnest men and specialists in various lines give us the benefit of what their experience has taught them, must have a telling and lasting effect upon the foundry industry, and must also exert an influence on some of us to wake up to modern methods and strive to achieve that success which awaits the vigorous, the up-to-date and hustling foundryman.

The original promoters of this organization need congratulating on the success that has both directly and indirectly attended the results of their forethought. Since its inception various organizations and associations have been formed, and the effect has been the wide expansion of our industry and many improvements in the methods and the opportunities presented to all foundrymen, whether members of the American Foundrymen's Association or not, to interchange ideas and to profit by meetings of this character.

I thank you, Mr. President, for the opportunity to say these few words, and I again bid you all welcome to old New England, and trust that your stay with us will be instructive, enjoyable and beneficial. (Applause).

Now, Mr. President, it will give me pleasure to introduce a representative of the city of Boston, who will also say a few words of welcome. It is my pleasure to introduce Mr. James H. Doyle, chairman of the Board of Aldermen, of the city of Boston.

**Address of MR. JAMES H. DOYLE,
of the Boston Board of Aldermen.**

Mr. Chairman, Gentlemen of the Convention: I have been delegated by His Honor Mayor Collins to represent him at this convention. I know that I cannot begin to speak for the city as well as Mayor Collins could, but, as his absence is unavoidable, I trust that this convention will accept me in his place as representing the city of Boston, and will at least give me the credit of being willing, if not so able.

I shall not detain you long, as I am not an orator. However, it gives me great pleasure, in behalf of the citizens of Boston, to welcome such an aggregation of business men and employers. You are the men who make industry possible in this country, and your branch of the mechanical business is one of the foundations which make the great manufactories and give employment to so many hundreds of our citizens. It occurs to me also that you must have always treated your employees well, as I have never yet heard of any serious labor difficulties in which your association or employees were involved.

Gentlemen, If I had the power I would wish to have you all come to live in Boston. We need people like you. You are the men who make business good. You spend money, and your employees spend money. You employ men, and men are the foundations of this great republic. In your industry you must have men—and when I say men I mean manly men, and not callow specimens of the race. Many of you have doubtless worked up from the lower branches of the business, and that shows to my mind what industry and application is capable of in this country. Again, I extend to you the greetings of the City of Boston, and I trust that you may all be prosperous in business as well as in health. You need your employees, and they need you. When we die we cannot take any of our earned or un-

earned increment with us, so let us give our brother men a helping hand, and we will feel better and probably die no poorer.

I thank you for your attention, and hope and trust that you may all leave Boston with good feelings towards the town known as the Hub, and a town which always likes to extend its hospitality to such a representative body of men as yours. (Applause).

Mr. Carpenter: Mr. President, I think we have been exceedingly fortunate in having given to us for the purpose of holding our sessions the facilities that this Institute affords, and it will now give me pleasure to introduce to the assembly Prof. C. F. Park of the Massachusetts Institute of Technology.

Address of PROF. C. F. PARK.

Mr. President and Gentlemen: It gives me much pleasure to extend to the Foundrymen's Association, on behalf of the Massachusetts Institute of Technology, a hearty welcome. We are pleased that you are meeting with us, and we gladly extend the use of our hall and all other hospitality to so worthy an organization. It seems quite fitting, that education and practice can be allied in this annual convention, for in this age scientific education and practice must go hand in hand. We hope that you will feel at home with us in any of our buildings. We hope that you will feel that while you are here this hall is yours, and that our laboratories, which will be opened for your inspection, are free for your use. According to your programme, our engineering laboratories will be open to your inspection to-morrow morning. This is one branch of our technical training that we feel is perhaps of particular interest to men of your attainments. We trust that you will feel free to visit us at any time, and we will be glad to take you through any part of our institution. (Applause).

Vice President Prince: Gentlemen, I will call on Mr. Bell to respond to the welcome extended to the American Foundrymen's Association here.

Response of MR. C. S. BELL.

Mr. President, I think it is proper and right that we should

express the gratification that we all enjoy in being so cordially invited, in the first place, and then so cordially treated this morning. There is no place, probably, that would be so interesting to a foundryman to visit as the city of Boston. We were delighted when we learned that we had an invitation here, and we certainly feel highly gratified this morning to know that we are here, and we convey to these gentlemen who have been so kind to explain the situation how much we appreciate what they have done and what they propose to do. Now, while it is true that probably all foundrymen will not be able to get into the pearly gates in heaven, there is one thing they will be glad to remember as they go down the stream of life, and this is that they have had the privilege of visiting Boston. (Applause).

Vice President Prince: Gentlemen, the first business before the meeting is the reading of the Secretary's report, I believe.

REPORT OF THE SECRETARY.

Another prosperous year has been given to us, wherein to consolidate our resources, improve our plants, and plan new developments in our ever increasing industry. The difficulties encountered lay in getting material rather than orders, all foundries abreast of the times making money. As the foundry industry consumed over three and one-half millions of tons of pig iron, besides the proportionate amount of scrap, in the last fiscal year, and iron has averaged at least \$15 a ton during that time, there is little wonder that with such enormous sums involved, and these distributed into every nook and corner of this great land, the foundry industry is looked upon as a good barometer of the general business condition of the nation. With indications pointing to a still further advance in pig iron through increased consumption, many of our foundrymen are contracting for next year's delivery, and fortunate are those who have covered their this year's requirements at fair prices.

Our Association seems to have experienced a similar change to a more prosperous condition, the latter half of the fiscal year just closed, indicating an interest so marked that our members

have every reason to be proud of the standing being acquired by it in one of the numerous lines of the industrial development of the world. There is an unusual amount of interest manifested in the study of cast iron. Those industries into which large quantities of castings enter, making close enquiries about their quality. The molder's art is beginning to be recognized as one which is most intricate and important, and there is a general inclination to place the molder himself upon the plane of a highly skilled workman who should not waste his time and his employer's money by performing unskilled labor.

Perhaps the close economies effected in the steel industry by utilizing the highest skill obtainable, or in other words, by paying for brains well directed, has left an impress on our own methods, for we also are beginning to demand the greatest production at the lowest cost, and are furnishing the best of facilities and paying the best of wages to do it.

There have been many changes in the membership of our Association. Death has reaped a harvest, and removed many men most useful to our industry. The sad and tragic death of our worthy president, Mr. John J. Sadlier, was, perhaps, that least expected by us all. Hale and hearty while at our last convention, full of the fire of life while discussing the molder of the future upon the floor of the house; honored by founder and molder alike, he fell by the bullet of one of the very artisans he had helped to make. Appropriate action was taken at the time by our Executive Board, engrossed resolutions expressing the profound sorrow of our members for the man they had honored with the presidency, were conveyed to his bereaved family. The general wave of sympathy, finding its expression even in Europe, showed that his efforts to better the standing of the foundry, as well as uplift the men employed in it, were thoroughly appreciated.

In spite of the deaths, resignations, removals from the list, and consolidations, we can record a net increase of 17 names, making the total membership 314. The tide turned during the last few months of the year just closed, and was aided by the addition of members from England, Scotland, Wales, Germany and Holland. Inquiries from Denmark, Russia, South Africa, and even India, may result in extending the usefulness of our As-

sociation into those fields, and go to show that the world is taking note of American foundry practice, and is presumably wondering how we can afford to be so liberal with our information.

During his recent travels in Europe, your secretary met with many of the foremost directors of industries, State officials, financiers and scientists, and nearly everyone exhibited the liveliest interest in American methods of procedure, in our national resources and transportation facilities, and in our declared national policy. There were a few who affected to look down upon us with the scorn bred of centuries of industrial security, but who will none the less live to rave at the "American Peril" when we cut into their holdings. Everywhere cast iron was the topic of general interest. Your secretary, whom you so kindly accredited to represent our Association abroad, found it well known everywhere through its work, even if he did have to translate its name into several languages to enable the enquirers to watch specially for the proceedings in the technical press of their respective countries.

At the Buda-Pest congress of the International Association for testing materials, the study of cast iron was ably urged by the only three American members present, and each of the three is directly interested in a foundry. The result was the making of tests on cast iron a special feature of the work mapped out, and much will doubtless be learned by the associated effort of the many nations interested. Our own American Association for testing Materials, of which we are members, in its convention last week, devoted one entire session to reports on, and the discussion of, cast iron. The committee appointed by them to codify the matter of specifications will doubtless utilize those adopted by us last year to the best possible advantage.

On looking over the work of the Association for the past year, you will have noticed that it was very much in line with progress. The fact that we are nearly all foundrymen, and therefore with interests to conserve, has not prevented us from urging better methods to obtain better results. We are more interested in furnishing our customers with the best of castings than they may be willing to give us credit for, as we have to hold a field which the requirements of the times is making more and more difficult to care for. Our national economy will not long tolerate

the production of great weights of inferior cast iron when comparatively light steel castings will do at least as well. The watchword is now to put the best of material into the best made castings, in great quantities and at extremely low costs. There is little wonder that the excellent papers on the molding machine now being published in our Journal are attracting wide attention. We hope they may be extended a long time yet, and be made most exhaustive, so that a foundation may be laid upon which even future generations may build. We have also to thank the technical press, as well as the great engineering associations for the interest taken in our efforts for foundry betterment, in which they have given us substantial aid.

Your secretary begs to report further that the change of time provided for the payment of the annual dues has been effected. While this has cut off one-third of the income of the Association for the year, yet it has placed our finances on a sound footing, no advance dues being now taken to pay bills in arrears. The Association will therefore hereafter pay as it goes, and can regulate its expenses properly. The fact that there were no outlays whatever incurred by the Association during the absence of the secretary in Europe, helped to tide over matters, and it is hoped did no injury to our members. The financial statement will be found in the report of the Treasurer. Briefly summarized the figures are as follows: Total income for the year, \$2,353.98; total expense, \$2,352.62; leaving a balance of \$1.36 in the treasury; no bills outstanding; the Association free from debt, and with as bright a future ahead as the members wish to make it by the extent of their substantial support. This excellent showing is, however, in a great measure due to the work of the Standardizing Bureau, the profits of which went into the treasury. Our special thanks are due Mr. West for the disinterested manner in which he has devoted time and money in the furtherance of a work now everywhere recognized as of great value to the foundry and the steel industries.

From the item of \$250 for postage, it will be noted that the office work of the Secretary has been nearly doubled, but the good results have well repaid the additional effort this caused. There has been a great call for back numbers of the "Journal," especially by the libraries of our Universities, the government, the

public foundations and foreign sources. The supply is getting limited, and some of the pamphlets which were printed in two editions are already exhausted. Our "Journal" has been enlarged and only a press of other duties prevented it from taking an even more extended shape.

Our Institutions of learning have not been idle in the matter of devoting time to the study of foundry problems. Besides a large correspondence with the professors most interested, your Secretary, as well as our Mr. West, have recently addressed the students of several of our largest universities on foundry matters.

There are two further subjects to which our Association might do well to give a substantial encouragement. The study of the electrical properties of cast iron, in conjunction with Purdue University, as reported to you last year, but not acted upon further on account of lack of funds. Then American support is most urgently needed by the Sidero-Chemical Laboratory established in Switzerland, for international research in the very lines which will be of the utmost value for the standardization of methods of the laboratory. Should we get into the position that something can be done for these matters a substantial impetus for foundry progress will result in at least those immediate lines.

The work of the various committees has been assisted as far as possible by your Secretary, who, in conclusion, wishes to thank the many members of the Association for the kind expressions of appreciation extended, the earnest help given, and the faith in the aims and ideals of our co-operative effort held forth, all of which has made him feel that the good will of the whole iron industry is with us in our chosen work.

Respectfully submitted,

RICHARD MOLDENKE,

Secretary.

Vice President Prince: Gentlemen, you have heard the report of our Secretary. What is your pleasure?

Mr. Slocum: I move that it be adopted and that a vote of thanks be passed, Mr. Chairman. (Motion was seconded and adopted).

Vice President Prince: The next business before the meeting is the reading of the Treasurer's report.

TREASURER'S REPORT.

Balance	\$ 68.31	
Cash remittances from Secretary.....	2,285.67	
	<hr/>	2,353.98
Amounts expended.		
Sundries	\$ 40.13	
Salaries	900.00	
Printing	105.85	
Journal	958.30	
Postage	250.50	
Standardizing Bureau	97.83	
	<hr/>	\$2,352.61
Balance in Bank, June 6th, 1902.....	\$ 1.37	

Respectfully submitted,

THOS. D. WEST,
Treasurer.

Mr. Seaman: Mr. Willis Brown, who is Chairman of the Auditing Committee, not being present, I have been requested to present the formal report

REPORT OF THE AUDITING COMMITTEE.

We, the undersigned, a committee appointed at the last meeting of the association to audit the accounts of the Secretary and Treasurer, beg to report that we have found the accounts correct.

(Signed.)

WILLIS BROWN,
J. S. SEAMAN,
WILLIAM YAGLE,
Auditors.

Vice President Prince: You hear the Auditors' report. What is your pleasure in regard to the Auditors' report? Is it that it be approved and accepted?

(Motion made to accept the Auditors' report, seconded, and adopted).

Mr. Seaman: Mr. President, it is a very easy matter for an auditing committee to make a report when the treasurer or secretary puts things before them in such shape that all they have to do is to cast up the figures on two sides and see that the balance is all right. I would, however, like to add something right here. We all know that when Dr. Moldenke took hold of the secretaryship of this association the organization was very largely in debt. We all know that the secretaries of this organization since its formation have been under a salary. We know that Dr. Moldenke is entitled to a salary just as well as anybody else, and more so, from the fact that I think if our former secretaries spent five hours in a week in the work of this association Dr. Moldenke has spent about five days. If there is any man entitled to his salary I think that Dr. Moldenke is. All I want to say to this association, and more especially to its Executive Board, is that Dr. Moldenke has not had his salary. He makes a report here that we have \$1.35 in the treasury. Now, you can draw your own conclusions. I want to see action taken on this matter, notwithstanding what our Secretary may get up and say—I know that he is just itching to get up—we owe him \$700 and he is entitled to it, and I think he should be paid. I want to see somebody appointed to devise ways and means for us to pay this salary, and more that it be referred to the Executive Committee of this organization. (Seconded and carried).

The Secretary: I wish to give the members an explanation. When I took the secretaryship there was some \$600 debt in the association, which debt I immediately proceeded to wipe out by using the moneys that came in, paying the bills and letting my own salary, which, by the way, includes all the expenses connected with the office, and is \$100 a month, stand. At the end of last year matters had been so arranged that all the debts were paid, excepting \$600 owing to the Secretary. By the change in the constitution the payment of the dues was made to cover all periods up to July 1st. Therefore, in sending out bills during the year, everything was calculated to bring the payment up to July 1st, which means that the first month brought the full \$10 and the last month brought only \$1. Therefore in my report you notice I say that one third of the income of the association was wiped out for that year, because we stopped all the advance

payments and brought everything up to the 1st of July. I did not mention the fact that there were seven hundred dollars owing to me at the end of the fiscal year, for a simple reason, that I took a voucher and donated this money to the funds of the association to put it on a good financial footing; and that I hope will stand. I simply gave my work and my goodwill to the association for the benefit of the trade.

Mr. Seaman: I object to that part of it.

The Secretary: I may say further that present conditions are as follows: From the 1st of July we will have the full income for the year available, and at the end of the year all expenses, the expense of the Secretary's office included, will be paid, I think, all right, if all our members stay with us.

Mr. West: Mr. President—There are six other reports upon which action should be taken, and I would be glad to have them acted upon as I proceed with them, as I am liable to be called home at any time on account of sickness. The first report is that of the Standardizing Bureau.

REPORT

On the Operations of the American Foundrymen's Association Standardizing Bureau

Your committee begs to report that the sales of the Association's Standardized Drillings continue as large as during the last three years, and that this work is becoming of constantly greater importance as shown by a very much wider distribution.

Not only are the blast furnaces and laboratories dealing with cast iron utilizing our drillings for their daily standards, but where disputes arise concerning the accuracy of individual work, our Standards are sent for to settle them. Thus the purpose for which the Bureau was originally created has been fully accomplished, and the iron industry has acquired a very material help toward a better basis for the daily routine.

During the past year a second lot of sample "D" has been made. We can also state that the Bureau is now in position to furnish the trade single bottles of samples "A, B, C and D," to cover those cases where the sets of three or four bottles, which sell for \$5.00 and \$6.66 respectively, are not desired.

The drillings can be obtained by addressing the chairman.

Through the efforts of one member of our committee a substantial reduction in the cost of analytical work has been secured for the trade, and this from two reliable laboratories in Pittsburg and Cleveland. Silicon, sulphur, phosphorus and manganese determinations at 40 cents each; and the carbons in iron, and sulphur, carbon, and ash in coke at 70 cents, are the quotations made, with rebates on a sliding scale where two or more determinations per day come from the same firm.

The addresses and other information can be obtained from the chairman.

The accounts of the Bureau up to date of June 1st, are as follows:

Total expenses to date.....	\$ 707.80
Collections to date	1312.77
Bills receivable	57.30
Drillings on hand—190 pounds.	

All of which is respectfully submitted.

Thos. D. West, Chairman, Sharpsville, Pa.
 Richard Moldenke, New York,
 James Scott, Pittsburg, Pa.,
 P. W. Gates, Chicago, Ill.,
 E. H. Putnam, Moline, Ill.

On motion the report was received and the committee continued.

Mr. West. The next report we have is that of the Committee on Standard Methods of Sampling Pig Iron.

REPORT ON STANDARD METHODS OF SAMPLING PIG IRON.

In conformance with the instructions received at the last convention, your committee begs to make its report on a standard method of sampling pig iron for foundry purposes.

In his memorial to the Association, urging standard methods of sampling, Mr. A. L. Colby emphasised the necessity of this action in order to avoid unnecessary complications between furnacemen and founder. Your committee, after studying the matter, has come to the conclusion that inasmuch as the furnaceman has the burden of the trouble to bear in case of rejections, it

is in his interest to see that the various car loads of iron he sells are sampled by the purchaser in the fairest manner possible.

Your committee did not think it wise to specify the manner in which a furnaceman should sample his casts, interesting as it may be; for we are solely concerned with the particular car load which comes to us, and have no means of knowing how many furnace casts may be mixed in it accidentally or otherwise.

We further recommend that the method to follow be adopted provisionally only, in order to give the furnaces an opportunity to give us the benefit of their experiences during the coming year. Your committee can then report finally.

Respectfully submitted,

Thos. D. West, Chairman,
Richard Moldenke,
James Scott,
P. W. Gates,
E. H. Putnam.

SPECIFICATIONS FOR SAMPLING PIG IRON.

1. Eight pigs shall be selected from each car load of iron, two each from the upper and the lower portion of each half of the car. The eight pigs, being of the average size and weight of the shipment, will be fairly representative of the whole.

2. These pigs are broken in such a way that a piece of convenient length showing a clean fracture is available. The eight pieces are placed in a suitable box, and this duly marked with the car initial and number.

3. The freshly fractured and clean face of each piece is now drilled in two places half way between the centre and edge, a drill of large diameter being used. From the heap of drillings surrounding the drill enough is taken for the purpose wanted, and placed on a sheet of glazed paper, the drillings are thoroughly mixed and preserved. In case of dirty or excessively sandy iron the magnet should be used on the sample before analysis, for additional safety.

4. Sufficient drillings shall be made to afford material for exchange with the furnace laboratory, as well as with a possible

subsequent checking with the American Foundrymen's Association Standards.

5. The allowable variation from specified compositions shall be as follows: For Silicon, 10 points either way (plus or minus 0.10 per cent.). For Sulphur not over 0.005 per cent. above the determinations, in case of a dispute, to be made by the oxidation method. For Manganese, 10 points either way. For phosphorus, not over .05 per cent. above for all irons running over .30 per cent. Below this the variation shall be a matter of special agreement. For Total Carbon, if specified at all, the variation shall be a matter of special agreement.

6. The variation of the check determinations between foundry and furnace, as well as with the American Foundrymen's Association Standards, shall not be over the following: Silicon, .05 per cent.; manganese, .05 per cent.; sulphur, .005 per cent.; phosphorus, .02 per cent., and total carbon, .05 per cent.

The Secretary: Mr. President, I would like to say a few words in connection with this report. These specifications are drawn up, as the report states, for discussion during the year and possible adoption at the next convention. The report includes quite a lot of material, which will want to be digested pretty thoroughly, and which may possibly give rise to some opposition; but at the end of the year we will be better able to report finally. For instance it would be a question whether the method of selecting the pigs and drilling them suits the furnaceman. He is the man who suffers if we throw a carload back on him, and he also is the man who would like the fairest way to be used when his material is sampled. Then, again, the allowable variations in the specified composition. If you buy a carload at 2.50 silicon and get 2.60 or 2.40 that ought to be good, but if you get 2.75 or 3 per cent. that ought not to go. It is the variation that may be allowable in the specifications which will be finally adopted that we want to get settled. Then, also, the variation of the actual analysis. For instance, the furnaceman and foundryman may dispute about the correctness of a determination. They will send for the American Foundrymen's Association standard samples—and this has been done many times, have them analyzed by the two chemists to check themselves, and on this will depend the rejection of many carloads of iron. But

even there there must be a variation. Two chemists cannot agree absolutely. But we give the limit, and give it now, so that it can be talked over during the year and then settled. If we then can report something for adoption, it will be a substantial advance in the trade relations between the furnaceman and the foundryman.

Vice President Prince: This is a very vital point, and during the coming year it should be given a great deal of thought. I think that it is very necessary to determine the exact amount that we should have of silicon, sulphur and phosphorus. While we may know what we require to meet our different specifications, I think there is a chance that we may be compelled to pay a little more for pig iron if we are too close.

Mr. Conlin: I move that the report be received and placed on file, and that the committee be continued for another year.
(Motion seconded and adopted).

Mr. West: The next report we have is that on the Grading of Pig Iron by Analysis.

REPORT ON THE GRADING OF PIG IRON BY ANALYSIS.

Your committee begs to report that in view of the developments brought out during the discussion of this matter at the last convention, a very evident leaning being manifested toward the purchase of pig iron, simple by its analysis, irrespective of the question of grading by fracture, particular pains have been taken to inquire as to the extent to which this is actually the case in present foundry practice.

It was found that with the exception of the jobbing founder practically everyone else is now specifying the composition of the iron he buys, or else is particular to find out what he does get. For these founders, who consume about three-fourths of the pig iron sold to foundries, the labors of your committee would be superfluous. For the jobbers, however, who are in the great majority, so far as isolated small shops are concerned, much good could be done, and doubtless has been by the agitation the subject has received. Unfortunately we must report that there is no interest to be observed from that direction, very

few of the several thousand jobbing foundries being members of our Association, or interesting themselves in the elevation of their trade. These foundries will continue to buy their No. 1 and 2 irons by fracture, irrespective of what they really get, will have their little troubles and get over them as heretofore, and receive the leavings of the founder who buys by chemical specification, and sees that he gets what he wants. Your committee does not see that it can be of any use here either, for the present, beyond agitating for closer lines on the composition of the different numbers now in the market, a work which it believes is quietly going on.

Since the feeling in our Association seems to be in the direction of exact methods of buying iron, the majority of founders, not members of our Association, do not appear to be interested, we would suggest that our committee be discharged.

Respectfully submitted,

Thos. D. West, Chairman,
Richard Moldenke.

Mr. Bell: Mr. President, after the reflections of friend West on the jobbing foundryman I want to say this: The jobbing foundry has a great deal to contend with, and if its business was vast enough to justify chemical analysis for every grade of iron that it buys or wants it would be a very great undertaking. A jobbing founder has to have many kinds of iron to make the different kinds of castings that he must turn out. As a rule, he is of the old school. He knows an iron when he sees it pretty well, and it is not easy to fool him with any kind of fracture or analysis. For the reason that he requires these different varieties it would be very much of a complication to go through the methods suggested in the reports. The jobbing founders will have to jog along in the old way very much, not because they are not producing what they want, but because they are producing what they want in the way they are competent to do it. It might be that it would be a long while before they would be educated up to the high point that they could have all classes of iron and be able to use them in a scientific way. They have no disposition to cast any reflections upon the large concerns, which use, probably, but one grade of iron, or two. They appreciate how valuable this information is to those people, but

they are not able to take advantage of the position of these people who use one class or two classes of iron on a very large scale. (Applause).

The Secretary: Mr. President, the Committee would like to be discharged, as it says in the report. I am one of the members myself. We fully concur in what Mr. Bell has said. Those jobbing founders who are progressive are with us, and those jobbing founders who are not progressive are not with us, and so we cannot see that we can do any more than we have reported.

Mr. Best: Mr. President, I move that the committee be discharged with thanks. I think their duties have been very arduous and have been carried out effectively. Not only so, but there are great difficulties in the way of trying to get old style founders to take up the new methods of getting out work. There are different methods that could be adopted whereby the practice in foundries can be improved. Over in Canada, where I come from, there are a lot of small foundries. Almost every village has one. Go and tell them anything outside of the routine of what work has been done, and they will say, "Why, we have got the iron, and we do our work," and so on. I suppose you have foundries on this side of the line that are working somewhat on the same principle; that is to say, so long as they get an iron which will do the work. I move that the committee be discharged, with thanks.

(Motion seconded and adopted).

Mr. West: The next report is the progress report on Standard Methods for Determining the Constituents of Cast Iron.

PROGRESS REPORT ON STANDARD METHODS OF DETERMINING THE CONSTITUENTS OF CAST IRON.

The importance of adopting standard methods for determining the constituents of cast iron was fully recognized by this Association, when at the last convention it instructed the Standardizing Bureau to take up this work, and report thereon as soon as convenient. We beg to report that a large number of circular

and personal letters have been sent out to the professional men in our industry, requesting memoranda upon their methods, with a view of selecting standards therefrom.

These reports will be duly published in the "Journal," (omitting all names) in order that all the information may be properly grouped for critical study by the experts who will be asked to select the methods best adapted to our requirements.

In the meantime your committee solicits further communications from active iron chemists in order to have as wide an experience to draw from as possible. The amount of material received already indicates a wide-spread interest in this work, and it is to be hoped that a final report can soon be made.

Respectfully submitted,

Thos. D. West, Chairman,
Richard Moldenke,
James Scott,
P. W. Gates,
E. H. Putnam.

Report received and filed. The committee was continued.

Mr. West: I now have the last report.

PROGRESS REPORT **On The Foundry Trade School.**

At the last convention the undersigned was appointed chairman of a committee to work in the interest of a **FOUNDRY TRADE SCHOOL**, wherein apprentices could be given the best practical and technical training for their trade, this training to fit them for the responsibilities even of master-mechanics and managers. The committee was recently enlarged by the appointment of Messrs. Putnam and Moldenke, but owing to the short time available since then, no opportunity has existed for any concerted action.

In the meantime, however, articles have appeared on the subject in the Trade Papers, and much criticism has been provoked partly favorable to the proposition, and partly unfavorable. Your committee believes that enough has been written during the year to warrant an expression of opinion on the part of the

members of our Association, as to whether the committee should be continued in the interest of this work.

It is the opinion of your committee that such an institution is badly needed, and that the day is not far distant when its importance will be disagreeably forced upon the trade. It will not do to sit by idly and be compelled to meet the issue. Far better to act at once. This is a movement, to be most successful, which should have the support of our foundrymen as well as the technical bodies interested in getting good castings.

Your committee asks for a full discussion of the matter in order to decide whether the work shall be conducted under the influence of our Association, or be left to outside effort.

Respectfully submitted,

Thos. D. West, Chairman,
E. H. Putnam,
Richard Moldenke.

Vice President Prince: Gentlemen, you hear the request of our Treasurer in regard to this school question. I think, as he does, that this is a question that should be discussed very thoroughly by the foundrymen of this country. I think there is no question, but that the foundrymen ought to have a school of some nature wherein the fundamental principles of the foundry business can be taught. As it has been in the past, we have all worked in the dark, and the old guard has done what they were taught from their apprenticeship. I think that instruction in foundry practice would help to elevate the business and be a benefit to us all. Gentlemen, you have heard the request of your Treasurer. What is your pleasure?

Mr. Slocum: Mr. Chairman, for a good many years I have, and I expect a good many of us have, been attending foundrymen's meetings monthly. Once in a great while we find something of interest; a great many times we don't. But in my experience with these meetings, the thing which has interested me the most has been a series of papers which have been read and discussed before the Pittsburgh Foundrymen's Association on this same subject. We have had one or two very able papers and discussions on those papers—papers read by Mr. Kreutzpointner of Altoona, who is very well informed, has evidently made a life study of it. I think he opened my eyes, as

well as those of a great many others, as to the things which we did not appreciate and did not understand. We went to work there and received the co-operation of the superintendents of manual training schools of Pittsburg. They came and talked to us one evening at our meeting, bringing models, giving views, showing the entire process, and it was intensely interesting. It was practicable. It showed us what might be done. In the curriculum of these schools, one phase, the larger phase, is teaching the students to appreciate and understand the metals and materials which they may handle in after life, especially those occurring in the neighborhood in which they are being taught. Consequently in Pittsburg the instruction turns largely on iron and steel and the things which are used in conjunction with these two items. In some of the schools they have gone to the extent of drilling the boys in the work of most of the departments necessary in a well regulated foundry. They take up the carpenter work, the pattern work, moulding, and the actual use of a cupola. Some of the work which is turned out by these young lads, would put to shame a good many men that are employed in our pattern shops. As a matter of fact, they go even farther than that. Some of the small models which they exhibited of course were largely fancy work, but the skill and the understanding necessary to produce them showed an understanding which surpasses some moulders I have in my shop. Still those moulders have been taught a trick and can earn their money. I should be very much disappointed if this committee was discontinued. I think if it was taken up on the same lines on which we are endeavoring to take up the matter in Pittsburg, and carried forward, it would be a very large help to all of us, and I think most of the foundrymen would stand in a position where they would be very glad to take the graduates of these schools. I know that my concern, for one, would be very glad to get them. Schools of this kind would turn out young fellows who are bright. They would not take the course unless they were ambitious. All they need afterwards is a little strength, and getting into a foundry soon does this for them. They generally come out a little tougher than they go in—not only physically, but sometimes otherwise. I would suggest that this committee be continued on the same lines on which they have been working.

Mr. West: Mr. President, may I add a word? I just want to catch a valuable point Mr. Slocum makes there, so as to continue the discussion. He refers to the benefit of our present technical schools in teaching the art of foundry. He admits that they are very beneficial. Now, I wish to make the statement, that at present all the time, for instance in Cornell University (which has a very excellent foundry, about the best I know of in the country), for teaching its students foundry work, is fifteen days, if I am right, altogether. If we will take into consideration that he admits that that fifteen days is so beneficial, what must we expect if we will have three and a half to four years of continued effort in that direction.

Mr. Slocum: Mr. West misunderstood me. I was not referring to Cornell; I was referring to our daily schools in Pittsburgh and Allegheny. I have had a little experience with the graduates of Cornell. I had a young man come to me when I was in Buffalo a few years ago who had gone through a course, and he was sent to me very highly recommended. He was not only a practical moulder, but he had the technicality; in fact, he had everything, a great many things which I did not have. The result was, after he had been with me two or three weeks, I gave him a position in the office.

Vice President Prince: I think the schools are perfectly proper. I think that the American Foundrymen's Association should take up this question. We have a fitting illustration right here in our acting president now. I am certainly not in a position to talk as intelligently to the foundrymen, as I should do. When it goes into the old fashioned work I could do it. I think foundrymen should all be in a better position both to talk and act and to instruct each other. This would be acquired by students going to a school and learning the business and being able to explain it. There are ideas which are coming out every day that should be put into shape and given to the foundry trade at large, and foundrymen as a body should be able to get up and talk intelligently.

Mr. Best: Mr. President, is it the intention of the association to form a central school, and from that to send literature throughout the land in order to form separate schools, or branches, whereby boys could be taught simultaneously from the cen-

tral school; or is it to establish a school in each locality working within its own sphere? It seems to me, if there could be a central school, with proper methods laid out from there, and literature sent out, whereby the boys could be taught, that good results might ensue. Mr. Slocum has made reference to the public schools. I have seen things produced by very small boys, boys of eight and ten years of age, which have been astonishing to me. After taking three or four lessons at what they term one of their "sloyds"—they call it sloyd over there—little boys will produce things in wood that to me have been wonderful. I don't see how the knowledge could be put into them, but it has been done. I have seen cases where pattern makers two or three years working at the trade could not do better than has been done after a few lessons by the boys. The teachers must have had great ability and great tact, to infuse such ideas into the children. If, as I said before, a central school could be established, and the information pass out, I think it would be of great good.

Mr. West: Mr. President, may I just offer an explanation? Mr. Best inquires what would be the nature of this school in regard to its distribution of work. At the present time ideas are but vague. The intention is to get started with a regular, practical, every day work shop, either connected with some technical institution, or in a locality where technical instructors could be had for the evening. Three or four evenings every week would be given up to the study of the principles of the trade and also to a study of whatever intricate work would be involved. All such information would be brought to the notice of the students, and discussions would be carried on along proper lines. Then, also, in matters of management. There is not one of us who is a manager to-day in a foundry but knows that when he became a foreman he was simply asked to be a foreman, there were no instructions given to him, and he was watched to see if he had the necessary tact. Nobody told him what that meant; he simply had to go in and use his wits the best he could. There is a great deal of information that I think can be outlined from experience and put into such shape that we can make for better managers than we have to-day. We can give the young men some confidence in themselves. We can lay down proper rules

and principles and give them a good general idea of business. As a rule, a man who is merely a foreman, with no money invested in the business, has a very visionary outlook. If we could knock that out of him and get him down to strict business, to realize, if possible, what it would be if he had his own dollars and cents invested, then he would have a different view of the matter as a manager. I believe a school of this character could bring returns from such a form of education. As to what might come after a school was started, why, that is an open question. But I don't look upon it as so necessary that this school be large. I think that if there were simply one school no matter where, with the influence that would come from it, there isn't a manager here who would not watch it, know what it was doing, know what its methods were, and an influence would go out from that school to his work shop. If there were only a dozen apprentices created by this school, I believe that it would be very beneficial the country over.

Mr. Seaman: Mr. President, I believe we had this discussion up last year at Buffalo and there was quite a talk about the matter at that time. The question was brought up of what was being done for a school of this class. I then made a report that we were in a fair way to have a school of this kind in Pittsburg, and a good school at that. The school should have been really—well, partly constructed by this time, but we in Pittsburg are like most all other cities, we have got a little too much politics there. The politics has interfered somewhat with the purchase of the ground for the institute. They are now about closing for the purchase of the ground. The city of Pittsburg will pay half a million dollars for 62 acres. Andrew Carnegie has donated \$7,000,000 to establish this institute, and I will say that one of the principal features of the institute is going to be the foundry end of it. I will say that the Chairman of the committee that has the arrangement and the designating of what the institute shall be is a foundryman. Another member of that committee is a foundryman. The Pittsburg Foundrymen's Association has appointed a committee to keep the directors and managers of the Carnegie Institute well stirred up in regard to the foundry business, which they are doing, and I think that we will have in Pittsburg an institute where any young man or old-

erly man that wants to get any information about the foundry business can get it, whether it be a course of six months or six years. We will have it all there. If our association undertakes to build an institution of that kind I don't think we will be able to raise the means to do it, in the first place, and it will require a large endowment. It is not simply a question of putting a young man on a foundry floor and shovelling up a certain amount of sand, or, in other words, as some express it, digging a hole in the ground and pouring iron in it. There is something back of that required. There is some knowledge required, some education required, in order to know why these things are done. This is the object of the foundry part of the Carnegie Institute. And it will be open for everybody. I really think it would be a waste of time on the part of the American Foundrymen's Association to take up this matter, unless they go in jointly with this institution and help to get things there up properly, as they possibly may overlook many things in organizing. I will say this, that the management of this institution is willing to receive any suggestions that would be to the interest of the foundrymen or the education of the foundrymen in the United States. I merely mention this matter so that the facts of the case may be understood, and also to let the association know what is being done toward the education of the foundrymen.

Mr. West: Mr. President, I beg for another word here. I am glad that Mr. Seaman has brought this subject up, because it permits me to make an explanation that I could not very well make in the report. I made a special trip to see Mr. McConway, the chairman of this Carnegie Technical School, to learn, if possible, what were their intentions, and whether or not it was to be an institution which would fill the need of advanced foundrymen of to-day. I had quite a long talk with Mr. McConway and it seemed to show me that the institution was not intended to fill what is being advocated on the floor here to-day. They mean merely to follow in the present line of colleges. I explained very explicitly to Mr. McConway what was needed, and he felt sorry that the thing could not be carried in that line, but as far as it was to go would be in the present day lines. I think that, if Mr. Seaman would have a conversation with Mr. McConway, he would learn of my visit to him and the result. It is

my opinion that any millionaire who wants to benefit the race to-day can do great good by donating a few hundred thousand, or, if he wants, a million dollars, to the object of establishing a strictly practical school, a practical every day foundry school, not where you have got fifteen days through four years, but where you have got every day for four years, eight or nine hours actual work and then your technical training outside. Give us a school like that, and the man that donates the money to support such a thing I think will build a monument to himself bigger than any that is done yet at the present day.

Mr. Slocum: Mr. President, I don't want to occupy too much of the time. I have had no personal conversation with Mr. McConway, but I have with other members of the committee. While no details have been gone over, the impression has been conveyed to me very forcibly that the idea of the donation was simply to do the most possible good, and ideas that have been brought up so far which were practical and could be utilized, they were going to adopt. If Mr. McConway has any such idea in his head at the present time as is suggested, I would like to make the motion that this association appoint a committee to work in conjunction with the committee of the Pittsburgh Foundrymen's Association to clear his head of those ideas.

Mr. Seaman: Mr. President, before the motion is put I just want to make a word of explanation in reply to Mr. West's remarks. The Board of Managers of the Carnegie Institute have not adopted any line of work, any more than that a full foundry equipment will be built and foundry methods taught, not only for light castings but heavy castings. They are going to build a large institution there. The idea is to educate young men who are taken from the public schools, to take them in there and give them all the branches of education that they require, and practical knowledge, so far as possible, not only in the foundry business, but in the machine business and in other kindred lines. The main object is to educate those young men in a mechanical line, to make them thorough mechanics, so that they can leave that school and into any workshop. We have our colleges, that is all true, institutes of different kinds; but Mr. Carnegie is reaching out for something far beyond this, just the same as he is in what he is establishing in Washington. We

all know what he is doing there. This technical institute is intended to be an advance beyond anything we have now. He wants to make it practical, carrying out the old theory that he does not want to donate anything to a lazy man, he wants a man to work and earn his own living, he is willing to put him in a position to earn his own living. His charity runs in that line. As we all know, he won't give anything outright to charity, but he gives it in that way, which is the best of charity.

Mr. West: Mr. President, another word, please. I would like to state here that we have got to bear in mind, in order to secure the greatest benefit from our school, that it is simply a business proposition. We have got to open up a shop, and we have got to obtain work. Nobody will come there and give work for the love of giving it and take anything he can get; he will come there the same as he would go to any other place. Quality and price is going to bring the work. Now, I emphasize again that in my conversation with Mr. McConway he could not assure me that Mr. Carnegie's ideas were along mine whatsoever or that he would take that matter up. I urged the importance of the work very strongly. He may have changed his views since then. They may be taking action along practical lines, but if they do they have got to have a regular shop, and they have got to secure work from the outside the best they can, sufficient to keep probably from 50 to 100 men, or students, going. I only hope that it is true, as Mr. Seaman says, that they are working along practical lines.

The Secretary: It has been moved and seconded that a committee be appointed from this association to co-operate with the Pittsburg Foundrymen's Association in the direction of the Carnegie foundation. I think it ought to be amended to carry the discharge of the present committee.

Mr. Slocum: I accept the amendment. My idea of having a committee of this association working with the other was simply to make it more marked that there is a demand for a school of that kind.

Mr. McPhee: Mr. President, we don't seem to thoroughly understand the matter. Is there to be a foundry attached to this school? There seems to be a kind of misunderstanding in the matter. I should like to say right here at this time that this

is the proper place for us to go to work and listen to the ideas of the foundrymen on these lines. If Mr. Carnegie is going to work to establish a foundry to educate student in the foundry business we ought to have some explanation, so that this committee might be instructed to wait on the men in Pittsburg that are going to have this foundry, if there is going to be a foundry. If there is not, why, it seems to me that there is a splendid field right straight here in the Foundrymen's Association of the United States to go to work and take this up and establish a foundry school. We know to-day that the foundry is away behind other trades; we know that it is, and something that we ought to have is instruction given to the moulder. While of course the pattern maker to-day is considered far ahead of the moulder, I tell you I think it is the place for him to go right straight into the foundry. The moulder makes mistakes. The pattern maker makes mistakes; but it is not considered a mistake in the pattern maker, it is only an oversight. A great many times, when I have seen the patterns brought into the shop and worked on, I have thought that the pattern maker ought to put in about two years in the foundry in order to get at his drafts.

Mr. Bell: Mr. Chairman: Mr. Seaman is probably the best informed man in regard to the Carnegie Institute that there is on this floor or anywhere else outside of the trustees themselves. He is in constant communication with them, and he knows as nearly as anybody knows their purpose. They have not decided upon the line of what they are going to build or what they are going to do, but they are investigating, and their intention, so far as expressed or known now, is to organize such a school as Mr. West and these other gentlemen are advocating, and, having the best means, when they undertake to do it, they will undoubtedly undertake to do it well. Mr. Seaman is also of the committee of the Pittsburgh Foundrymen's Association to keep in touch with the trustees of the Carnegie Institute, so that he, as he has informed us, is advised of the advanced position that those trustees occupy. We, as an association, as the American Foundrymen's Association, can appoint a committee to co-operate with him and his committee, giving it more strength, giving more force behind it to carry out what

it is already doing in Pittsburgh, urging the trustees of the Carnegie Institute to establish just the very thing that has been advocated here. I believe that is the idea.

Mr. Slocum: That is the idea of my motion.

(Motion adopted).

The Secretary: Mr. President: I think the next thing on the programme is the presentation of the Standard Specifications for Steel Castings. The American Society for Testing Materials have devised specifications for testing steel castings, and, as we are members, I have had them printed, and they are distributed here, as discussion is welcomed. They have been adopted now and are generally used.

STANDARD SPECIFICATIONS FOR STEEL CASTINGS

As adopted by the American Association for testing Materials, of which the American Foundrymen's Association is a member. These specifications are presented before our Convention with a view of eliciting further discussion on the subject.

PROCESS OF MANUFACTURE.

1. Steel for castings may be made by the open-hearth, crucible or Bessemer process. Castings to be annealed or unannealed as specified.

CHEMICAL PROPERTIES.

2. Ordinary castings, those in which no physical requirements are specified, shall not contain over 0.40 per cent. of carbon, nor over 0.08 per cent. of phosphorus.

3. Castings which are subjected to physical test shall not contain over 0.05 per cent. of phosphorus, nor over 0.05 per cent. of sulphur.

PHYSICAL PROPERTIES.

4. Tested castings shall be of three classes: "Hard," "Me-

dium," and "Soft." The minimum physical qualities required in each class shall be as follows:

	Hard castings.	Medium castings.	Soft castings.
Tensile strength, pounds per square inch	85,000	70,000	60,000
Yield point, pounds per square inch....	38,250	31,500	27,000
Elongation, per cent. in two inches....	15	18	22
Contraction of area, per cent.	20	25	30

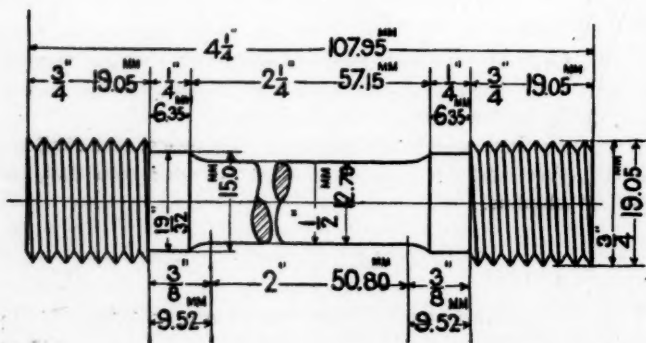
5. A test to destruction may be substituted for the tensile test, in the case of small or unimportant castings, by selecting three castings from a lot. This test shall show the material to be ductile and free from injurious defects, and suitable for the purposes intended. A lot shall consist of all castings from the same melt or blow, annealed in the same furnace charge.

6. Large castings are to be suspended and hammered all over. No cracks, flaws, defects, nor weakness shall appear after such treatment.

7. A specimen one inch by one-half inch (1" x 1-2") shall bend cold around a diameter of one inch (1") without fracture on outside of bent portion, through an angle of 120 degrees for "soft" castings, and 90 degrees for "medium" castings.

TEST PIECES AND METHODS OF TESTING.

8. The standard turned test specimen, one-half inch (1-2") diameter and two inch (2") gauged length, shall be used to determine the physical properties specified in paragraph No. 4. It is shown in the following sketch:



9. The number of standard test specimens shall depend upon the character and importance of the castings. A test piece shall be cut cold from a coupon to be molded and cast on some portion of one or more castings from each melt or blow or from the sink-heads (in case heads of sufficient size are used). The coupon or sink-head must receive the same treatment as the casting or castings, before the specimen is cut out, and before the coupon or sink-head is removed from the casting.

10. One specimen for bending test one inch by one-half inch (1" x 1-2") shall be cut cold from the coupon or sink-head of the casting or castings as specified in paragraph No. 9. The bending test may be made by pressure, or by blows.

11. The yield point specified in paragraph No. 4 shall be determined by the careful observation of the drop of the beam or halt in the gauge of the testing machine.

12. Turnings from the tensile specimen, drillings from the bending specimen, or drillings from the small test ingot, if preferred by the inspector, shall be used to determine whether or not the steel is within the limits in phosphorus and sulphur specified in paragraphs Nos. 2 and 3.

FINISH.

13. Castings shall be true to pattern, free from blemishes, flaws or shrinkage cracks. Bearing surfaces shall be solid, and no porosity shall be allowed in positions where the resistance and value of the casting for the purpose intended, will be seriously affected thereby.

INSPECTION.

14. The inspector representing the purchaser, shall have all reasonable facilities afforded to him by the manufacturer to satisfy him that the finished material is furnished in accordance with these specifications. All tests and inspections shall be made at the place of manufacture, prior to shipment.

Mr. President: The next thing will be the presentation of the Method of Insuring Patterns, by Mr. Conlin, who is here and is ready to address us on the subject.

MEMORIAL ON THE INSURING OF PATTERNS.

The favorable comment and general interest taken in a paper entitled, "Insuring Patterns," read at the last annual convention of the American Foundrymen's Association at Buffalo, 1901, warrants further discussion on the subject with the view of reaching some tangible results therefrom.

The question of the insuring of patterns has not received the attention due its importance, and there is an urgent need for the adoption of some standard method of adjusting fire losses and establishing trade regulations regarding customers' patterns

Accordingly this memorial is respectfully offered for consideration in due appreciation of the great value of concerted action and official recognition from so representative a body as the American Foundrymen's Association

It is urged that a committee be appointed to study the question of the insuring of patterns, to obtain the views of both Foundrymen and Fire Underwriters, formulate a code and publish it in the American Foundrymen's Journal, and request criticisms as well as an exchange of ideas on the subject. The result of such deliberations to be incorporated in a final report with recommendations for adoption at the next convention of this Association.

The high rate of premiums charged, and in fact the general unwillingness of insurance companies to assume full fire risks on patterns, is owing largely to the difficulty experienced in arriving at a true appraisal of values. This is mainly due to the general absence of complete records of patterns embodying systematic classifications as to service value. It is also a fact that the insurance companies have no clearly-defined working basis as to depreciation deductions, etc.

This lack of system can be remedied by bringing the foundry and the insurance interests together. It is practicable to have adopted and brought into general use a "Pattern Clause" to be attached to the insurance policy, making the contract as to pattern risk, subject to the rules jointly adopted by the Board of Underwriters and the American Foundrymen's Association.

It is also equally feasible to adopt rules and regulations governing important questions concerning pattern insurance,

which would avoid many troublesome tangles as to the adjustment of fire losses, all to the mutual relief of both assured and insurer.

It is an easy matter to arrive at the cost value of a pattern, but the deductions for depreciation is the bone of contention. The service value is the true value of a special tool like a pattern. It is limited to the cost of reproduction.

To arrive at a true basis for the appraisal of pattern values it is necessary to consider:

First.—A method of classification, under specific headings, such as

- Active or Current.
- Active, Worn.
- Semi-active.
- Repair for Emergency.
- Obsolete.

Second.—A fixed allowance for depreciation deductions to be made either annually or semi-annually, and according to changes as to service value as defined by the above classification.

The adoption and use of a general form of book or card system record, including classification and valuation, would remedy the present erratic and unreliable methods of determining fire losses. In the same way pattern risks would be more readily accepted and possibly at lower rates by eliminating the hazard caused by general lack of record to substantiate claims as to loss of patterns and their service value.

It is entirely within the scope of this Association, which is and should be the Foundrymen's National Board of Trade, to establish rules and regulations similar in effect and general usefulness to those adopted by the New York Produce Exchange and other trade organizations. By this means trade customs would be legally construed and the adopted rules regulating the insuring of patterns would become the law and usage of the foundry trade.

Various important questions which are to-day open to much discussion and doubt, could be effectually disposed of. The responsibility of the foundryman to his customer for pat-

terns lost or damaged, owing to fire casualty, is a subject not generally understood, and for the mutual benefit of both parties, their respective positions should be clearly defined. For instance, the ordinary form of policy insuring the foundryman's patterns does not include the property of others. A policy containing the clause covering "the patterns held by the assured, the property of others for which the assured may be responsible," requires evidence to show that the foundryman entered into a specific agreement to be responsible for the customer's patterns. Otherwise the question of responsibility is one to be left to a jury, and according to the common law as to bailments, the foundryman, whether compensated or not, is only responsible when it can be proven that he did not exercise ordinary care in the preservation and protection of the property destroyed, and the term "ordinary care" is held by the court to mean that degree of care which an ordinarily prudent man usually exercises in the preservation and protection of his own property. (See Parson on Contracts and Scouler on Bailments).

The conditions surrounding a customer's patterns are different from those owned by the foundryman, in as much as they should always be considered as active and of value equal to the cost of replacing. They are held by and subject to the control of others, and should be covered by a floating policy insuring the patterns wherever they may be. For these reasons, the question of insurance in regard to customer's patterns requires attention as to the best form of policy available, so as to enable the customer to secure the most effective protection against loss by fire casualty.

The transfer of patterns via railroad or other common carriers is clearly defined by law in a general way. The compensation paid for the transportation includes also the guarantee to deliver the goods in same condition as received, and the common carrier accordingly is supposed to insure the shipment, while he is responsible for it. It would be advantageous to clearly define where this responsibility begins and where it ends.

Under the province of trade usage or custom, it is advisable to define if the term "pattern" includes as well, core boxes, follow boards, matches, etc., or any special rig which may be used in connection with a pattern for use in moulding from same, of course not including flasks.

It is also desirable to define the trade meaning of the terms used for classification of patterns, so as to identify their condition, value, and prospective service as active, repair, obsolete, etc.

The storage of patterns involves the question as to natural hazard. The consideration of the most desirable location and arrangement of structures for the care and protection of patterns is important in many ways, one of which is to lessen the element of fire risk which would tend to reduce both restrictions and rates of premiums as to patterns.

The advisability of insuring patterns under a blanket policy covering them wherever they may be within given boundaries, or of fixing a specified amount of insurance on the item of patterns of each building in which it is the practice to store or use them, is also a question worthy of attention.

It is hoped that the value and importance of bringing the subject of pattern insurance into more systematic shape, will be recognized by the adoption of a code of rules regulating and defining the various questions involved, and by this means a lasting service rendered.

It is, therefore, urged that it be

Resolved, That a committee of three be appointed to formulate rules and recommendations concerning the insurance of patterns to be submitted for adoption at the next convention of the American Foundrymen's Association. That such committee be authorized to confer with the proper insurance officials with the view of securing their co-operation in the consideration and adjustment of the various questions relating to the insurance of patterns.

Respectfully submitted,

F. CONLIN.

The motion of Mr. Conlin was seconded and carried. Mr. Carpenter then made some announcements with reference to the ball games and civic parade scheduled for the afternoon, and Mr. Brown then took the floor to detail the historical trip.

Mr. Brown: That historical trip is simply a trip in the old, congested part of Boston, taking in the old residences and old

locations of the events of the Revolution and before that time. There can be no conveyance; it is simply a walk, which will take some little time, perhaps two hours and a half. It is a very short walk, however, the lecture of Mr. Waterman, the guide, taking the time in explanation as we go along. During the walk there will be one or two stops. One will be at the King's Chapel, the church that was here before the Revolutionary times. We are to be admitted there by special arrangement, and will have a resting spell. A little later we come to the old John Hancock Tavern, where the Tea Party originated, and where the citizens dressed as Indians to make their attack and throw the tea overboard. There we are to have a little tea served! So that it is really wholly an historical trip, and those that would enjoy any such thing we should be very glad to have with us. It was arranged particularly for the ladies, but all gentlemen will be very welcome.

Vice-President Prince: Dr. Moldenke will now present a memorial on the proper valuation of pig iron in the foundry.

MEMORIAL

On The Proper Valuation Of Pig Iron For Foundry Purposes.

The undersigned respectfully begs to memorialize the American Foundrymen's Association on behalf of a better method of valuing pig iron for foundry purposes than is at present in vogue.

As far back as our memories will carry us, there have been made pig irons of good, indifferent, and poor value, for the making of castings, and with few exceptions they have been sold on practically the same terms. In view of the fact that at the present time every effort is bent upon securing better material for our castings in order to hold the field cast iron is entitled to, it behooves us to devise some standard methods by which a poor iron may either be culled out, or else sold for its intrinsic value only. On the other hand, the maker of pig irons which have suffered least from careless burdening, improper mixing of ores with waste products, and other practices better known to the furnaceman, but not tending to good strength in the resulting pig, should be rewarded therefor accordingly.

It is a well known circumstance to all founders that pig irons of the same shape, grade, and presumably the same composition, but coming from different furnaces, when remelted under as nearly the same conditions as possible, will often show entirely different strengths. Those who have laboratories will know that this is even the case when the composition is approximately identical. For this reason it is somewhat of guess work to predict the strength of a casting from the composition of the irons used, and an element of doubt remains even with the best of mixing and manipulation.

Now that the Standardizing Bureau of our Association has made such a splendid record in the course of bettering methods of foundry procedure, why not let it go one step further, and instruct it to devise methods by which we can better judge the value of the pig irons offered us.

As a starting point the following is suggested: The value to us of a pig iron is seen only in its remelted state, therefore to test it we must put it through cupola or furnace, and under conditions which will give it the fairest chance possible. Furthermore the iron should be cast into test bars according to the standards provided for by this Association. An analysis of the pig iron and the test bars as well as the physical tests of the latter, can then be made, and we will know that a given iron when remelted and tested has such and such a strength for such and such a composition. We may then choose for our work, condemning the weak irons and selecting those which show promise of fulfilling the conditions required.

Since the furnaceman should have the means of valuing the iron he sells just as much as the foundryman who does the buying, it would be advisable that specifications be drawn up for a standard test cupola, standard methods of melting, pouring, etc., of a stated amount of pig iron. A suitable blank shall be drawn up in which can be filled all the information necessary to properly value the iron.

Furthermore, it is suggested, that besides furnishing these standard methods to the trade for the individual use of any one who desires to obtain the information, facilities be given the Standardizing Bureau to take this matter in hand themselves for the benefit of those who do not care to go to the trouble of

carrying out the process on the exact lines indicated. The bureau will then be in position to actually make the bars for test and prepare the samples for analysis. The bars can then be sent for test and the samples for analytical work to the laboratory specified, or in the absence of instructions, be turned over to an approved laboratory. A moderate charge should be made to cover the work done, and to make the undertaking self-sustaining.

Should the plan here outlined prove feasible, the furnaceman who has good iron will find it a much easier matter to induce the prospective purchaser to try it. The foundryman, on the other hand, can buy the iron subject to the standard test, the results he wants of which he can demand guaranteed.

Gradually there will be a series of tests available which will serve to indicate the physical properties of a good iron of a given composition, when remelted, and we will hear less of inferior irons worrying the founder who has to furnish high grade castings. The undersigned would therefore offer the following:

Resolved, That the Committee on the Standardizing Bureau be requested to study the proper valuation of pig irons for foundry use, and, if possible, report standard methods therefor at the next convention.

Respectfully submitted,

Richard Moldenke.

Resolution seconded and carried.

The convention now adjourns to meet on Wednesday, the 18th, at 10 P. M.

The afternoon was devoted to various forms of entertainment. The day being the anniversary of the battle of Bunker Hill, a great military and civic parade was the principal feature. Our members were guests of the city, special grand stands being provided to accommodate them. Incidentally this shows how highly the industry is regarded by the good city of Boston, as it involved considerable trouble and expense on the part of its representatives, as well as "magnetism" on the part of the committee.

Again, those of the visitors who were addicted to the "Diamond" were given a treat in witnessing the game between the New York and Boston teams of the National League. Perfect weather promoted the happiness of everybody, and spoiled the chances for another business session that afternoon.

The third contingent were taken about the old city to study the points of historic interest, and this proved a most acceptable form of entertainment, as it brought us close to our early history. Few were they who saw the spot where the first patriot fell, who did not for an instant feel the inspiration of awe, as the thought of what came of this event flashed across the mind. Visions of our brave boys fighting in the Philippines were mingled with the more distant jets of fire from the flint-locks with blue and buff forms behind them, and brave red-coats rushing to their doom. The ground of old Boston seemed more hallowed after this, and our thoughts will ever stray back to a city of perfect repose, of culture that we long to see everywhere in our great land, and that warmth of friendliness which should make life there most worth living.

In the evening the convention gathered in the Tremont Theatre, which our hosts had practically reserved as a whole. An interesting comic opera was given; nor were there lacking telling hits on many of our more prominent members. All went home feeling that the day had contained about the maximum of events it could well carry, and many friendships were again cemented, new connections made, and solid thought and comment interchanged.

WEDNESDAY, JUNE 13th, 1902.

Through the courtesy of the Institute of Technology authority, parties of the members of our Association were conducted through the engineering laboratories, where the testing of materials was carried out. Prof. Lanza and the able adjunct professors of the department explained the various steam, hydraulic and compressed air systems very thoroughly. Illustrated methods of making boiler tests, engine and electrical tests, tests of wooden and steel beams, and methods of testing castings and cast iron. Thus an hour was consumed which proved most profitable.

At 10 A. M. Vice-President Prince called the convention to order for the second business session. The place of meeting was again in Huntington Hall, of the Massachusetts Institute of Technology.

Vice-President Prince then made the following announcements:

Nominating Committee.—Messrs. Yagle, Colvin, Golden, Wolff and Flag.

Auditing Committee.—Messrs. Seaman, Yagle and Brown.

Committee on Trade School.—Messrs. Seaman, Yagle, Zimmers and West.

Committee on Insuring Patterns.—To consist of Mr. Conlin as Chairman, with power to appoint two other members.

Vice-President Prince: I will now call upon Mr. Reid to read the first paper on the programme of this session.

Mr. Reid: Mr. President and Gentlemen: Dr. Moldenke and I had a little correspondence in regard to this paper, and, as you will notice later on, it is just simply the principle that is stated. There has been considerable criticism on the working of the plan presented in actual practice, but I can state distinctly that we have made it a success. A number of the foundrymen present to-day have been kind enough to say that it might do well enough way up in the wilds of Maine, but it cannot be done well here, and I think this will be a good opportunity for them to state their opinions, because we are here to get up discussions in regard to the various methods for increasing the foundry production.

Mr. Reid now read his paper, and then followed a

Discussion on SOME METHODS OF INCREASING FOUNDRY PRODUCTION.

Vice-President Prince: You have heard the reading of the paper, and it is open to discussion. I think Mr. Reid would be glad to answer any questions, because that idea of running double crews, night and day, is always a bug-a-boo to the founder.

Mr. Flagg: I would like to ask Mr. Reid a few questions. One is: Has he ever run this shop during hot weather, and, if so, how does he manage the crew of men with the pouring? How many hours do they continue at pouring? Another question is: Do the molders work piece work, and, if so, how does he adjust matters of loss, which a molder would claim was caused by the pourer, and was not his own fault. The third question is: Does he run a union shop with his molders? The fourth question is: Do they work in benches? I ask that question because I have run a shop double time, and we always had trouble with the hot sand and cold sand. Our benches were very narrow. With a wide bench I think it would be much easier to do it. If you will kindly answer those questions I will be obliged.

Mr. Reid: If I may take them in rotation I will do so. We have succeeded in running it in warm weather with the addition of extra men so that we have crew enough. I double my crew so that the men take one night off and one night on in pouring. The entire time of pouring depends a great deal on the amount melted, and that varies from three and one-half to five hours every day. The molders work day work. I make the statement now that in my opinion the work is better, we turn out more work for the same number of hands day work by this system, and get better results all around than we would on a piece work system. The third question: We do run a union shop. Some three years ago the men went out on strike. Every man was a member of the union, even the apprentices. But I took hold there and we made an agreement. They had asked for a very large minimum, and we rejected that. They had a set day's

work; I would not recognize anything of the sort. What I recognize as a day's work is what a man can do from the time he starts in the morning until he quits at night; that is the day's work, and we pay for it accordingly. You may call it a union shop, inasmuch as we have an agreement that we will pay not less than \$2.25 a day, that is all. There are three men getting \$2.25; the rest get over. The benches: I suppose you mean by that the floor space. The floor space averages nine feet wide by eighteen feet deep.

Vice-President Prince: Any more questions to be asked on this paper?

The Secretary: Mr. President: The chances are that this subject, which is an exceedingly important one, had better be left in such a way that if our members do not wish to cover it now they may write little discussions of it and send it to me, and I will be very glad to publish it, because working in the way Mr. Reid has spoken of may be one of the important coming things. That we are not talking of it much here is no criterion that we are not very much interested in it.

Mr. Trabue: Mr. Chairman: I did not hear Mr. Reid answer that question referring to the adjustment of losses occasioned to the molder by the pourers.

Vice-President Prince: His was day work, not piece work, and there would not be any losses to the molder.

Mr. Field: Does he find any trouble by the molders putting it on to the pourers, and the pourers laying it on to the molders? Even though it is not piece work there might be more or less friction caused that way.

Vice-President Prince: I think that being a day work shop there would not be so much friction between the molder and the pourer. If it was piece work I think Mr. Reid would find out that he would have considerable friction between the pourer and the molder, because when a molder is working piece work, he must stand his own loss, and naturally does not want any person else to pour his work for him. He will invariably blame it, if it is bad, on the pourer. That is the rule. Have you anything to say on this, Mr. Reid?

Mr. Reid: Well, only to add this, that if you will take molders as you find them, I am afraid that ninety-nine per cent. will kick anyway.

Vice-President Prince: The next paper on the programme is on Shop Conditions, by Mr. Hugh McPhee.

Mr. McPhee: Mr. President and Gentlemen: We understand how the foundry business at the present time is run, because, being all foundrymen, we pretty nearly understand each other. I must say at this time that while the foundry is becoming improved, still there is a large room yet in this direction.

Mr. McPhee now read his paper on "Shop Conditions."

Vice-President Prince: You have heard the reading of the paper. It is somewhat in the same line that Mr. Reid speaks about, shaking out and taking out the castings for the molder. It looks as though they are going to give the molder a better chance, from now on, anyhow. The paper is now open for discussion.

Discussion on ~~SHOP~~ CONDITIONS.

Mr. Reid: Mr. Chairman: Mr. McPhee reports here that he could put in eight hours molding instead of six. I am pleased to say that we get nine and one-half molding.

Vice-President Prince: Well, Mr. Reid, your conditions are different.

Mr. Reid: Certainly. It is all in the same direction, but Mr. McPhee could put it a little stronger.

Mr. Lanigan: I would like to ask Mr. Reid if he regulates the wages of the men in his shop by the number of flasks that they make. He tells us he pays \$2.25 upwards. Now, are we to understand that that is the minimum rate of wages in his shop, \$2.25?

Mr. Reid: \$2.25 is the minimum rate. We do not recognize any special amount, though in certain lines of work, where it is the same thing day in and day out, we have a pretty well defined limit to the ability of the man and regulate the price accordingly. If he does not come up to our standard he does not get the money. There are three men getting \$2.25, and the rest are graded according to their ability, that is the amount of work they put out. Does that answer Mr. Lanigan?

Mr. Yagle: We want to know how many foundries are in the town this gentleman comes from.

Mr. Reid: Mr. Chairman and Gentlemen: The gentleman asks the question how many foundries there are in the town—I beg pardon, it is a city (laughter)—in the city where I come from. There were three; there are two to-day.

Vice-President Prince: The reason that I brought up the question about Mr. Reid's conditions, or rather his time, was that in Pittsburgh nine hours is considered a day's work, and if you work three minutes over nine hours it is deducted from you the next day, or on Saturday, as they more generally keep the time. In some shops, nine hours being a day, if you work nine hours and ten minutes on Thursday and the same on Friday, you get off those twenty minutes earlier on Saturday. Whatever time you work over they deduct on Saturday, and the molders are supposed to get out. This is in some shops. Your shop appears to be a nine hour and a half or ten hour shop.

Mr. Reid: Mr. Chairman, in regard to that, I cover that, I think, in my paper, where I state according to the number of hours we are supposed to work. Now, I recognize the fact that in some districts they are struggling for eight hours a day, in some they have already nine. Our district is ten hours. I give them half an hour.

Mr. Lanigan: Mr. Chairman: I would like to ask Mr. Reid if he got an increased number of flasks on his standard day's work when he commenced to have the laborers do the pouring?

Mr. Reid: It certainly would not pay any other way. Our actual gain in molding time was two hundred and fifty hours a day.

And in that the work, of course, varies. On the bench we gain from ten to twenty flasks; on the floor, according to the work, from one flask to three.

Mr. Murphy: The worst of it all seems to be that we don't know the number of flasks put up in a foundry. I am rather familiar with the conditions in the eastern part of the country, and the conditions that can be employed in the shops around the eastern part of New England, and the method of running those shops are not entirely applicable to shops in the western part of the country that handle a larger and heavier and better class of

work. I remember one time I travelled down through the eastern part of Maine, and it took a mighty good molder, one that could do a great big day's work, to get \$1.50 a day. That is what a man paid me down there one time. They cast in the forenoon and in the afternoon, or twice a day. I asked him what he was going to pay, and he told me if I was a pretty good man he would give me \$1.50 a day. Of course I understand the conditions have been a little bit better up in this part of the country since that time, but nevertheless, the conditions that are applicable to shops in Maine, Vermont and New Hampshire, and part of Canada, would not be applicable to shops in other parts of the country. As a matter of fact there is not the class of mechanics in this part of the country that may be found in others. Down in that part of the country men are paid more for what they do, instead of for what they know. In the shops that are running all the time, they know what a man can do every day, and if he has got an extra hour to do any molding in they know just how many flasks he can put in. The system is a very good one, it is a modern one, and should be applied to any shop that can manage it. I have nothing whatever to say against the system, anything more than it is useless to discuss such things in any lengthy manner, because what is applicable to one shop is not applicable to another.

Mr. Pero. I want to take exception to one remark of the last gentleman, and that is that the class of mechanics in this part of the country are not as good as they are in other parts. I am a New England man. I have travelled over a good fair section of this country, as far west as the Mississippi, and from Quebec to New Orleans, and I have not seen any better mechanics than we have in New England. (Applause). There is some pretty heavy work done here. We have done about as heavy work right here in New England, right here in Boston, as they have anywhere. At the old Alger shop we cast 100 ton guns. We are doing about as heavy work as they are doing in most shops. At the Builders' Iron Foundry in Providence, with which I am in no way connected, they are doing pretty good work, and heavy work. I have been through Pittsburgh and Cleveland, and I want to say that right here in New England there are just as good founders, either at the wheel as foremen,

or digging in the sand heap, as they are anywhere. I am running a shop with somewhere from 250 to 280 molders, and I would like to know where I can get some real good molders at \$1.50 a day. I will clean out the work round here if I can get them.

A Foundryman: Mr. President: If they will give us 500 we will take them with us.

Another Foundryman: Mr. Chairman: I should like a few of those. We pay ours from \$4.00 to \$6.00 for a day's work.

Vice-President Prince. The next paper is on Foundry Costs, by Mr. R. P. Cunningham, of Holyoke, Mass.

Mr. Cunningham added special interest to his excellent paper by giving it entirely from memory, to the envy of all the hard worked public speakers present. He received the liberal applause which his efforts elicited with becoming modesty, and the general hope was expressed to hear more from him at future conventions.

The time now becoming quite limited the paper was not discussed. This was also the case with the papers which followed.

Mr. Edward B. Gilmour read his paper on "Cores and Core Arbors."

Mr. James A. Murphy read his paper on "Shop Tools and Rigs."

The Secretary read a paper by Prof. H. R. Richards on "Technical Education."

Mr. Diller's paper on "Effect of Melting Steel with Iron in Cupola," was distributed among those present and brought out the following:

Discussion on EFFECT OF MELTING STEEL WITH IRON IN CUPOLA.

Mr. R. S. McPherran: We have all read Mr. Diller's paper with great interest. Experiments along this line are always full of profit. It is not, however, simply a matter of increasing the tensile strength. The question of how much steel it is advantageous or beneficial to use can be answered only by the question—Into what kind of castings is it to go? It is an axiom that the strongest test bar does not always make the strongest casting. In many cases the questions of shrinkage and internal strains are as important as that of strength. It is to be regretted

that the shrinkage and deflection of these tests were not given.

I doubt if any stated percentage of steel can always be relied on to turn out the best results. Conditions of melting are never the same. Size and purpose of castings vary so that it is only by experiment and observation that one can determine the analysis giving the best results for that kind of castings. It then becomes a question of working toward that analysis.

To emphasize the importance of the final analysis rather than the mere addition of any given percentage of steel. I would like to call attention to No. 10 and No. 11 in the tabulated results. Here it will be seen that the bar to which twelve and one-half per cent. of steel has been added, actually contains less carbon than the bar with thirty-seven and one-half per cent of steel.

To conclude, I will only add that in my experience, steel increases the apparent strength in a greater ratio than it does the real. That is, it will increase the strength of a test bar more relatively than it will increase the strength of the casting.

Adjournment.

Hardly had lunch been discussed when the dulcet strains of several bugles from without announced the approach of an imposing cavalcade of "Tally-Ho" and carriage. All Boston seemed to have been requisitioned to furnish the apparently endless train. Messrs. Carpenter and Gibby saw everyone well placed. Mr. Magee, with graceful courtesy dexteriously landed a box of Boston sweets wherever femininity lent its charms to individual parties. With the Chief of Police and his escort at the head the jolly procession swept down the broad streets of the city into the Back Bay district proper, past the wondering meeting of the Christian Scientists, whose presence there caused us such trouble with our certificates, and into the delightful park system which had all the elements of sea shore, country, and park combined in exquisite manner.

The strains of the bugle on the "official" coach mingling rag-time with the Doxology enlivened things, and occasional stops to rest the animals gave opportunity for snap shots on the part of our "Hansen." In this manner a most agreeable coaching trip was enjoyed, the many turns and varied scenery contributing to the delight of those participating.

The grounds of the U. S. Arsenal and shops at Watertown were made the first alighting place, the officers commanding being waited upon and invited to accompany us. The Colonel in charge of the Government Station was also thanked most cordially for the opportunity afforded in visiting a famous foundry and shop. A number of disappearing gun carriages were in course of construction at the time, and the exactness of the work was much commented upon.

From here the procession turned to its objective point, the foundry of the Walker & Pratt Mfg. Co., which was soon reached. Far famed for its completeness and modern equipment. Where all manner of conveniences are provided for the workmen. Where molding is carried out on smooth concrete floors, and iron is carried about by trolley systems, we were, nevertheless, astonished to see the actual extent to which these labor saving and money making improvements were provided. A neatly printed guide to the works was handed each visitor. Men were stationed everywhere to properly direct the throng along the route mapped out, and explanations were given by the staff

of the establishment which aided a thorough understanding of the systems of work involved. The completeness of the arrangements for the benefit of the members of the convention may be seen when it is stated that even a drawing of the cupola was attached to it, to show the arrangement of the air entry.

On the lawn of the beautifully laid-out grounds surrounding the works, a tent had been erected, and a long table within groaned under the load of the good things provided. The assemblage did full justice thereto, for the long drive had sharpened the appetites. Everywhere the officers of the company, as well as the Entertainment Committee, were busy making everyone at home, and when the assemblage left again, three hearty cheers were given Mr. Walker to show the appreciation of the splendid reception.

Going back a different route, opportunity was given to see the venerable town of Cambridge. As the cavalcade passed through the grounds of Harvard University, doubtless many of the young men there wondered whether they would ever be identified with the world's progress as exemplified by our industry.

Arriving at headquarters, dinner and a short rest brought us to the next number on the programme. This was a "smoker," and a thoroughly enjoyed one, too. A profusion of good cigars, mild and semi-dangerous beverages, pipes and pouches of special tobacco were found on all the tables. Lunch came later in the evening, while a splendid round of vaudeville made the evening pass all too quickly. Returning with souvenir mugs, the delighted crowd wended homeward to find that the ladies had been similarly entertained in the assembly hall of the hotel by the indefatigable committee headed by Mr. Brown.

Thus ended the second day of the convention. This also had blended enough business and pleasure to fill out two days of ordinary life.

THURSDAY, THE 19th.

The morning and afternoon was given over to a steamer ride on the beautiful bay of Boston. A number of the members, however, by special arrangement with the Institute authorities, visited the chemical laboratories thereof, and were much interested in the equipment provided and the methods of instruction in vogue. One would think there was hardly room enough to house so many different sub-divisions of instruction, and the Massachusetts Institute of Technology is to be congratulated on its work in the interest of technical pre-eminence on the part of this country.

The members of the convention now took the cars to the boat, and embarked on what proved a most enjoyable trip, in spite of the rain which up to this time had kept carefully away. It proved only a passing shower, however, and in no way interfered with the general enjoyment of the day. Lunch was served on board to shorten the wait for the elaborate "Shore Dinner" afterwards provided at Nantasket Beach. The scenery about Boston harbor is beautiful, and was thoroughly appreciated by those on board, as was also the excellent music arranged for by the committee.

The memory of a "Shore Dinner" will linger long in the minds of those who have never before attacked a menu with clams in five different styles, and every variety of fish to be had about Cape Cod. All the other good things which went with it would make a society reporter feel envious. Suffice it to say that on this excursion ample opportunity was given for old friends to meet at leisure, new connections were made, the foundry foremen got together, the Nominating Committee performed its work, and general good fellowship reigned supreme.

Returning to Boston, the elevated railroad was taken, which at one place goes under the subway for the surface car, and headquarters was reached in time for dinner, and the business session to follow.

The last business session of the convention was held in the smaller hall of the Institute of Technology, this room lending it-

self better for the presentation of diagrams and stereopticon views, incident to Mr. Saureur's lecture.

Vice-President Best called the convention to order, and called for the report of the Committee on Nominations.

Mr. Yagle: Gentlemen: The Nominating Committee suggest the following names for officers of this Association for the ensuing year:

For President, Mr. W. A. Walker, of the Walker Pratt Manufacturing Company, Boston.

For Secretary, Dr. Richard Moldenke, of New York City.

Before announcing the name for Treasurer, I wish to state that Mr. West has declined to serve again, owing to pressure of business. We suggest the name of Mr. Willis Brown, of Erie, Pa.

For Vice-Presidents: First District, Mr. J. F. Lanigan, of Lawrence, Mass.; Second District, Mr. J. A. Becket, of Hoosic Falls, New York; Third District, F. H. Zimmer, of Pittsburg, Pa.; Fourth District, Mr. A. I. Finley, of Cleveland; Fifth District, Mr. Christian Wolff, of Chicago, Ill.; Sixth District, Mr. Adam Baer, of Milwaukee, Wis.; Seventh District, Mr. J. P. Golden, of Columbus, Ga.; Eighth District, Mr. T. J. Best, of Montréal, P. Q.

The committee would further suggest that the Executive Board of the American Foundrymen's Association take into consideration the appointment or otherwise of an assistant to the Secretary.

Vice-President Best: Gentlemen: You have heard the report of the Nominating Committee. What is your will and pleasure concerning it?

Mr. Seaman: I move that the Secretary cast a vote for the entire list. (Seconded and carried).

The vote was then cast by the Secretary, and the several nominees were declared elected officers of the Association.

Vice-President Best: (The President-elect came to the front of the platform). Mr. Walker, I take great pleasure in presenting you to the Association and assuring you of its hearty good wishes.

President-elect Walker: Mr. President and Gentlemen: It is, indeed, a very pleasant thing to think that in this room,

where twenty-three years ago I was taught the first principles of physics by Prof. Cross, I should have the honor of being elected President of the American Foundrymen's Association. Many of the facts that I was taught in this room I have forgotten long ago, but I hope I never shall forget the time when you were so kind as to elect me to this position of President. I thank you very much, Mr. President and Gentlemen, for the honor that you have conferred upon me. (Applause).

Dr. Moldenke: Mr. President: I also would like to add my sincere thanks for the kindness in continuing the honor that you have conferred on me, and I hope that I will be able to do even a little more next year than I did the last. I thank you very kindly, too.

Mr. Seaman: Mr. Chairman: I wish to make a motion to return thanks to the New England foundrymen, and its committees, for the kind and hospitable way that they have treated this convention and its members while here at this meeting. I make this motion not as such motions are ordinarily made. I make it with the sincere feeling, which, I think, will agree with that of all the members present, that we really, truly wish to return our sincere thanks for the kind reception we have received. (Applause).

Motion seconded and adopted unanimously.

Mr. Bell: I am authorized by the ladies in attendance on this convention to return their sincere thanks to the Committee on Entertainment for the splendid manner in which they have provided for their entertainment, and they wish these thanks to be put upon the minutes of the proceedings of the Association. These words faintly convey the feelings of the ladies in regard to the matter. There is a more eloquent expression in the bright eyes and winsome smiles of the ladies themselves, which have been cast upon the individual members of this entertaining committee for their much appreciated efforts. While the ladies have but little in common with the general business of this convention, or the details of the foundry business, still they have much to do with molding the character of the future foundrymen. They wish me, further, to ask for a hearty vote of thanks for the very successful provisions made to entertain them, and to express the pleasure it would be to remember their visit for many years. (Applause).

Vice-President Best: Gentlemen, it has been regularly moved by Mr. Bell, one of our past Presidents, and seconded by several gentlemen present, that the vote of thanks from the ladies should be tendered to the Entertaining Committee of the New England States, and that the words be inscribed on the minutes of our meeting.

The motion was adopted unanimously by a rising vote.

Vice-President Best: Mr. Bell, will you kindly convey to the ladies the appreciation with which their motion has been tendered and accepted?

Mr. Bell: I will, sir.

Mr. Prince: Mr. President: I move a vote of thanks also to those members who have so earnestly labored in the intellectual line by furnishing the papers which have been more or less discussed. If it would have been possible we could have had a fuller discussion of some of them, because I recognize many of them are of extreme value. They could have been talked over more than they have been. I think they are deserving of the hearty thanks of the Association. I would also, at Mr. Seaman's suggestion, most heartily mention our worthy Secretary for the labors which he has performed. These, somehow or other, always go without mentioning.

Motion seconded and carried.

Mr. Zimmers: Mr. President: I think that we should also tender a vote of thanks to the Walker & Pratt Manufacturing Company for the very nice way in which we were entertained yesterday. (Chorus of "second the motion").

Mr. Walker: Mr. President: I should be very glad if the motion did not prevail. I hope you will not place me or members of my company under any further obligation. The pleasure was ours, and we certainly did not desire any further thanks than your presence at our factory.

(The motion was adopted unanimously by rising vote).

Vice-President Best: Thank you. The motion prevails. Mr. Walker, you see by the standing vote the appreciation of the way in which your efforts for the entertainment of the Association have been carried through. For myself, personally, I can assure you that it has been a great pleasure to me, a greater pleasure than I can possibly give expression to, to visit your

works and its surroundings, and not only so, but to be treated so royally as we were treated there.

Mr. Stupakoff: Mr. President: I think we have omitted to express our thanks to the Institute of Technology of Massachusetts for their kind permission to use their hall. I would request that that be placed on the minutes, too, and our sincere thanks be tendered to them as well.

(The motion was seconded and carried).

The Secretary: Mr. President: I would like to say a word in connection with the certificates. Unfortunately they did not go through. There are only sixty-nine of them, and the rules of the Trunk Line Association of New England are so strict that we could not do anything about it. But I would suggest that when you buy your tickets home for the full fare, you get receipts for the tickets, and that you get the certificates, and pin them together, and write a pretty strong letter to the general passenger agent of the line you bought your tickets from, explaining the situation, that there were over and over enough members to get the rebate, but that it was not allowed because most of them got tickets from the Christian Scientists. I understand that the western roads, especially, will very likely give you the rebate, and that will be at least some consolation. We are sorry we could not secure the reduction, and this is the first time it has happened in our history.

Now, Mr. Chairman, I would like to bring up another matter. Where is the next convention to be held? I have received during the last few days telegrams and letters, especially from and through our member, Mr. Adam Baer, whom you have made Vice-President of the district, including Milwaukee, urging that this city be selected as the place for holding the next convention. This invitation has been supplemented by letters from the Mayor of the City of Milwaukee, and from the Board of Trade. We have no other invitation to record concerning the next convention, so if you wish to place the matter into the hands of the Executive Committee, or wish to decide now, it is awaiting your pleasure.

Vice-President Best: Gentlemen: You have heard the invitation given from Milwaukee by several gentlemen there, and you have heard the words of Dr. Moldenke. The subject is

open for discussion. There might be other places, perhaps, that some of you would like to have the next convention held in, but it seems to me that this being the only invitation received so far, the matter might be discussed at the present time.

The Secretary: I would like to add that the only other available place would seem to be Cleveland. We have practically no members there at all, and it might be good, of course, to hold the convention there to get members. Milwaukee, however, has now asked the second time.

Mr. Seaman: Mr. President: I believe it has been the custom heretofore that the Executive Committee decided where the convention should be held, and I think we might leave it in their hands again.

The Secretary: I would like to make a further announcement that we also have an invitation from St. Louis, from the Board of Trade, and from some of our friends down there, to hold our convention the year following in that city. Mr. President, we have now only a few matters to discuss before we go to the papers for the evening. I believe that we would like to hear from the executive officers of the Foundry Foremen's Association, who are here to-night, and who would like to address us on the subject of mutual relations between the two associations. I think the President of the Foundry Foremen's Association is with us to-night.

Vice-President Best: You will kindly come to the platform and express your views on the matter.

Mr. Loudon: Mr. President and Gentlemen of the Convention: The work of the Foundry Foremen's Association has been discussed considerably at this convention. This is an Association that was organized about fifteen months ago, in the City of Detroit, by Mr. Hansen and Mr. Thomas. Previous to that, Mr. Thomas and I had talked this matter over while he worked for me in Ansonia. Our idea was to get up an association for the betterment of foundry foremen. We felt that foundry owners had the National Foundrymen's Association for the protection of their interests, foundry owners and foundry foremen combined had this American Foundrymen's Association, and the molders had their Association. We as foremen were on the wall, with an association on each side of us, and if we wanted

any assistance in our laborious work in the foundry, we could not well get it in the office, and certainly we did not get it from the molder. Some of us have been unfortunate enough to be in a position where we have found ourselves shy of that knowledge necessary to carry us through many a difficult problem that has come up before us. The originators of this movement thought that if we could form an association of foundry foremen for the purpose of exchanging ideas and to help one another along it would be a good thing. Our road was rough, and we wanted to see if we could not get something up that would make it easier. So we started this movement off, sent circulars all round the country to the number, I think, of a thousand. Quite a number of the foremen here at this convention to-day claim that they have never received any notice, did not know that there was such an association in existence. I know of many a case myself where circulars were sent to a foundry but never got beyond the waste paper basket. And we felt that while some owners looked at the movement in the proper spirit, a benefit of a foreman being a benefit to them, other owners looked on it as if it was something of a detriment to their interests. We have brought the question up here, while we had so many foremen together, so that we could get their views better than we could by sending out all the literature we could conceive of. We had a meeting last night in a corner at the "smoker," and we continued the meeting this morning. There were quite a few very nice suggestions made for the success of this association, that is living, but that is about all. We have in the fifteen months got between forty and fifty members. And several of the members of the American Foundrymen's Association have been much interested in hearing more of it to-day. I myself had a talk with the Secretary of this Association, and I told him just about the lines that we were trying to run this thing on. He thought it was a very good idea, and suggested a combination of effort on the part of the two associations.

Mr. Hansen: Mr. President and Gentlemen of the American Foundrymen's Association: Mr. Loudon I believe has covered this ground very fully, so far as the objects of the Foremen's Association are concerned. Some doubt has existed in the minds of foundry owners, who seemed to think that

the foundry foremen of this country were trying to form an association which would follow the lines of the Iron Molder's Union, and that if they could not obtain any request they made they would strike for it. This in itself is absurd, because we all know that nearly every molder in the shop is willing to become a foundry foreman if he only can. I want to say to the foundry owners who are here present that our organization is not formed for the purpose of enforcing any demand, but for better enlightenment of the foremen, and to put them in position to help one another. I have always contended that if they could not help themselves nobody else would help them. In regard to affiliating with the American Foundrymen's Association, it is very well in all undertakings to have a central head, and I feel that the Foremen's Association really would be much more useful while affiliated. At the same time, I believe it should be optional, just like the local Foundrymen's Associations, whether they belong to the American Foundrymen's Association as individuals or not. There is a certain benefit to them in reduction of dues, and they receive all the papers which are published.

The Secretary: It would be possible to come to some arrangement by which the members of the Foremen's Association may become members of the American Foundrymen's Association, under certain fixed rules of dues, etc., which can be devised by the boards of both associations getting together. Possibly the best thing would be to make a motion to that effect. If it is possible to get them together, we get the advantage of the foremen belonging to us, as members, and you get the advantage of our publications coming to you and coming to the conventions, meeting with wide awake foundrymen, with all that this means.

There was considerable discussion on the ways and means of getting together, and further explanations seemed in order.

Mr. Ludon: Mr. Chairman, I would like to add a word. You can readily see that any foreman, according to the constitution of the American Foundrymen's Association, is entitled to put in an application to become a member, and he will do well to join it, but we really need more. Suppose a foundry foreman was in great difficulties in his foundry, something going

wrong,—and that is liable to come up any day,—and the owner was feeling a little rusty about it, feeling sore, too many by-paths, cost going up too high. That poor unfortunate foreman could be tided over if he had some helping hand just to give him a tip where he was going wrong. It is impossible, at least I think so, for an organization combined of foremen and owners, to help here because none of the men would feel like giving himself away. Few owners will know how to help the foreman, and yet he is greatly in need of the answer. The Foundry Foremen's Association is formed just for the purpose of assisting one another where they are in difficulties. A man doesn't need any assistance if he is going all right, but a man that is going along all right sometimes can help another man that is not just as fortunate as he is. That is the reason why this Foremen's Association was formed without considering membership in the American Foundrymen's Association. In forming it we knew there were quite a number who were members of the American Foundrymen's Association, when we were asking them to become members of the Foundry Foremen's Association; but one reason why the Foundry Foremen's Association was formed was because a man is sometimes timid, he doesn't know just where a question asked might turn up, he doesn't know who might hear about what he asked, or what might happen, and the result is that he would not ask it anywhere else but would go on in the old rut until he would either be discharged or some other thing would happen.

Mr. Bell: Mr. Chairman, I wish simply to make a suggestion. We have a great deal of business to perform here this evening. While it is very interesting to hear these gentlemen discuss this question, which is a new one that has been presented, we have made ample provision in our constitution for just such cases as this, and I don't see any reason why the Executive Committee cannot promptly act upon the question on this basis. We have a provision in the constitution that members who apply for admission to the American Foundrymen's Association shall pay \$5 as dues, whereas for outsiders, like myself, it is \$10. Now, these gentlemen have formed an association. It has an alliance with this business, with this object that we have in view. Why can't they come in under that provi-

sion? If the ground was free from other questions I would make a motion that the Executive Committee be authorized to admit these foundry foremen under that clause of the constitution. They are eligible as it is, only there is the question of the amount of dues that they would be required to pay. Without some action of this kind, recognizing their association as an association associated with this, they would be charged \$10 a year, but by recognizing this association as one that is an adjunct to the business, why, they would be entitled to admission at \$5. I think that is the solution of the thing if you discuss it five years.

Vice President Best: Gentlemen, you have heard the motion already made, that the Executive Committee of this Association and the Executive Committee of the Foremen's Association should discuss the matter of consolidation of effort, and that our Executive Board be empowered to act.

There was considerable discussion on this motion and on voting, a division was called for. The motion, however, prevailed on counting the ayes and noes.

The Secretary: Mr. President, I would like to say, for the benefit of harmony, that if the gentlemen who voted no will kindly give their reasons to the Executive Committee it will be a great help in deciding the question at issue. There might be something that could be cleared up. Now, Mr. Chairman, there are only a few things to come up yet. I think some of our chemists present would like to say a word.

Mr. Flintermann: Mr. President, if I may have just a few minutes. There are a number of gentlemen present who are perhaps more interested in the metallurgical part of the foundry business than in the practical part, and I have heard an expression of opinion given a number of times to this effect: that it would be a pleasant part of these meetings if we could have a little programme by ourselves, in which we would discuss metallurgical problems alone. These discussions, perhaps, would be too tiresome for the whole body. The idea that we had was that a committee be appointed at this meeting, and that they should get up a programme, perhaps, a number of papers, which should be read at a special chemical session, which should meet in connection with this association at a time set, say an hour pre-

vious to the general meeting, so that this special metallurgical or chemical session would in no way interfere with the regular business of the association and yet be open to all. If I may be permitted I move that such a committee be appointed. (Motion seconded).

After some discussion regarding the scope of the proposed idea it was finally thought good to establish a metallurgical section as part of the association, to meet in separate session at the convention, the session, however, being open to all. In this manner purely metallurgical or chemical questions, of lesser interest to the practical foundryman, can be discussed more freely. The motion prevailed. Mr. Flintermann was appointed chairman of a committee to devise ways and means to carry this idea through, and was empowered to select his own co-workers.

Dr. Moldenke: Now, Mr. Chairman, there is one more thing before we get to the papers. One of our members present made a very good suggestion. I cannot now recall his name; it is that a committee be appointed to study the question of recovery of nickel from the anodes used in the nickel plating process, which many of our foundrymen make use of. If the gentleman is present he can probably explain it better than I can; but if he has gone home we will have to let it lie over to next year, but I just mention the fact that it is a subject that should be of considerable interest to foundrymen, a great loss is incident to the incomplete use of the nickel of to the anodes. This has to be retreated and is then sold back to you, at some loss. Now, there is something we might look into during the year with a view of helping those of us who do metal plating.

Mr. Slocum: I believe this is under new business. I only want about two minutes. I have been requested by several members of the association to make a few remarks concerning certain statements made by members of this association at various sessions, and before previous sessions, somewhat to the effect that the foundries and foundrymen in the last thirty and forty years have made no progress, that they are standing still, that as compared to other arts and other trades they are not in the same race. The easiest way I can refute that is simply to refer to my own experience; therefore that is what I speak of. My experience has been in the line of brass founding, cast

iron pipe, radiators, general founding, and car wheels. Any man who will get up to-day and state that thirty or forty years ago he could make brass castings, bronze or false bronzé, as the case may be, to meet our present specifications and analysis, would be taken as a joke. Any man who would get up and state that he could make pipe with our present processes, at three pipe to a flask for small sizes, without our present power machinery in the way of trains, drums and rolls, and handling of our heating ovens, and for boring and other processes, would simply be told he did not know his business. The better way to put the statement as to car wheels is this: in the last fifty years our specifications and tests and requirements have increased in the neighborhood of 250 per cent. We are meeting those requirements to-day better than we were when they were 250 per cent. less than they are now. In radiators we are making them to take a severe test, a closer inspection, of one half the weight, for one quarter the price, and more artistic and to meet the requirements better. As for the general jobbing department, I will simply state that if any man should get up on this floor to-night and say he had been in the foundry business for fifty years and was not making better castings at a lower price, he would not be wanted by any of us as a foreman. I think statements of that kind should be taken and carried forth for what they are worth. A man who thinks he has not made any progress may think so from his own experience, but he should not be entitled to so express himself. Mr. Lobdell supplemented these remarks by citing from his own experience with roll and car wheel work, quoting the common practice of formerly cutting the journal of a roll out of the solid chilled portion, as it was impossible to make the roll casting than as it is now.

The question was debated at some length by Messrs. Lobdell, Slocum, West, Gilmour and McPhee, and as a question like this has two sides, the manufacturers of special lines showing enormous progress, while the back-counting foundry shows none, it was resolved

That the foundry has advanced greatly within the last thirty years, and that anyone claiming the contrary does not voice the opinion of the association.

Motion debated and carried. Mr. Lobdell promising to speak further on the subject at the next convention.

The papers for the evening were now taken up. Mr. Field presenting the subject of the "Metallurgy of the Cupola." Mr. Stupakoff followed next with his two papers on the "Molding Machine," discussing the subject of jigs and flasks for this class of foundry apparatus. As Mr. Stupakoff added much matter of interest his remarks are given in full herewith:

Discussion on the MOLDING MACHINE.

Mr. Stupakoff: Gentlemen, I have had the privilege to bring you a few papers in the proceedings, describing some mechanical features which are frequently used in the foundry, and I have been requested, especially by your Secretary, to bring some information about molding machines and combine the whole thing in a continuous series of papers. Those few papers which I brought before have described some parts which do not seem to have any intimate connection with molding machines themselves, and it may have appeared to you that what I have said in those papers should not have come under the head of the molding machine; but I expected, in bringing you further description of the matter and treating the matter fully, to show you the intimate connection which all these little parts which I have therein described have with the molding machines themselves. A molding machine is generally considered by all foundrymen as a thing by itself, and if a foundryman, or a foundry owner, or a foundry foreman, or a molder, has a molding machine in his hands or in the shop he thinks that machine by itself is a complete thing. That is a wrong idea, and it was my intention in describing these details in connection with molding machines to point out the mistake which is generally made in this direction. I have used a great many molding machines, of a great many different kinds, and I have always found that a molding machine is of no use whatever unless it is used judiciously and unless it is in the hands of an intelligent man. You may place a laborer on a molding machine after you have rigged it up for him, but unless you keep all the tools of such a machine in good condition it will not give you the desired service. Among other things, if a molding machine is brought into a shop it is oftentimes expected that it shall make all kinds of castings. That is an entirely wrong idea. A machine is always limited to a

certain size and certain depth and certain style of castings. If a molding machine maker tells you that his machine will make 200 or 300 flasks, and I have seen it described that a machine will make a thousand flasks, you had a great deal better keep your hands off that machine; but if a man comes to your shop and says, "I will possibly effect you a saving of 25 or even 20 per cent. in the cost of your castings," I think you have a perfect right to place confidence in that man. But that machine which is recommended under those conditions will not even give you this 25 or 20 per cent. saving unless it is used judiciously, and unless certain attention is paid to the details, to jigs, or to flasks, which are used in connection with it. The greatest difficulty which is generally found with the use of molding machines is the placing of patterns on the table of the molding machine, and I have endeavored to explain to you a simple, perhaps the simplest way of all in one of these papers, which I have headed "Jigs." As a jig this contrivance may be known, especially by machinists or mechanics in connection with a machine shop, while in foundry practice it is called frequently a transfer plate. Under that name it is oftentimes known by the molders. If such a transfer plate or jig is in the hands of good mechanics they will be able to make use of a molding machine, even in the jobbing shop, where a molding machine was never of any use before. Ordinarily you cannot use a molding machine for castings which are poured in small quantities, but if you have the means of placing patterns on a molding machine quickly, we will say in half an hour or an hour fill the table of a molding machine, it may be oftentimes of an advantage to turn out a small order in the jobbing foundry—we will say of 50 or of 100 castings—on such a machine, but that cannot possibly be done unless you are provided with the certain tools for doing it. Your machine must be made in the first place practically perfect, and the jig or the transfer plate which is used for that purpose must also be made by good mechanics. The work is generally left in the hands of pattern makers. Pattern makers will usually make an accurate job, but if you have a mechanic, or I won't say a mechanic, a machinist, a good machinist or tool maker around your works, he will generally be able to perform such a job to better satisfaction. After such a jig as I have described in this

paper is in your hands, and you have an ordinary kind of a pattern, and you want to make perhaps fifty or more castings on your machine, you place this pattern on any convenient place on this jig, place it in a frame, and drill holes into one half of your pattern, we will say, providing the pattern is split. Then place the other half of the pattern against the first part, drill through both of them. Next place the plate, this jig plate, on the table of the molding machine, and drill through the identical holes with which you have drilled your patterns into the table of the molding machine, and you can place the patterns correctly on the table, so that if the flask is turned you can make out of a single pattern double the amount of castings in one flask, which generally will be found of an advantage in ordinary foundry practice, and which especially if of advantage in jobbing foundries if there is only one pattern at hand. If the tables of molding machines should have been provided before hand with an identical number of duplicate holes as in the jig which is used for drilling your patterns, then you save yourself the work altogether of drilling the table of the molding machine each time, which is really quite unnecessary. The holes I have found by experience in a table are not at all objectionable in casting, but if they should be they are very easily closed up with a little beeswax. If you have once used such patterns on a molding machine you can fill the table of such a molding machine—or drop table, it is not necessary that it should be a molding machine, a drop table is just as good—within about fifteen minutes completely with patterns, and you have your molding machine ready for work. Those are points which are very seldom known by foundrymen, and on that account I thought it would be perhaps of advantage to bring them to the attention of all the gentlemen present. Besides, I mention in the second paper, which forms the fourth chapter of this general paper on molding machines, something about flasks. There has been so much said about these things that it is hardly necessary to go into the detail. I merely call attention to the necessity of keeping the flask in first-class condition. It is not sufficient to use flasks in connection with any machine molding or drop plate molding which are maksshifts. You will never be able to make such appliances a success in your foundry unless you have first-class flasks, and these flasks, of

course, must be kept in the first-class condition. You have the papers before you, when you have leisure time after getting home you may be able to study and read them a little bit, and I shall be glad to hear your comments on them.

Mr. Albert Sauveur now delivered a most interesting lecture, an outline of which, appended herewith, was handed to those listening to make it more easy to follow the speaker. Mr. Sauveur has promised us the manuscript and it will be published in full later on.

**BRIEF SYNOPSIS OF AN ILLUSTRATED PAPER ON THE
APPLICATION OF METALLOGRAPHY TO
FOUNDRY WORK.**

Remarks concerning the close analogy between the structure of cast iron and the structure of steel.

The appearance of wrought iron under the microscope.

Change of structure due to the introduction of a small amount carbon converting of thereby the iron into soft steel.

Structural changes produced by an increase in the amount of carbon.

The structure of medium-hard and of hard steel.

White cast iron considered as a very high carbon steel.

The structure of white cast iron.

Absolutely gray cast iron is made up of a matrix of iron and particles of graphite.

The structure of gray cast iron.

Cast iron containing both graphite and combined carbon is made up of steel matrix and particles of graphite.

The structure of gray cast iron containing increasing amounts of combined carbon.

Relation between the strength of cast iron and its structure.

Value of the microscope in revealing the presence or absence of the structure corresponding to greatest strength.

The influence of the rate of cooling, of silicon and of other impurities upon the structure.

The detection of phosphorous under the microscope and its effect upon the structure.

Effect of chill upon the structure.

On motion Mr. Sauveur was thanked by a rising vote. There being no further business the convention adjourned.